

Berichte  
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Institut für Meereskunde  
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MEAN HORIZONTAL FIELDS OF TEMPERATURE,  
AVAILABLE POTENTIAL ENERGY AND MEAN  
MERIDIONAL CROSS-SECTIONS OF  
TEMPERATURE FOR EACH JANUARY AND JULY  
OF THE PERIOD 1973 UNTIL 1976  
AND FOR EACH APRIL AND OCTOBER  
OF THE PERIOD 1967 UNTIL 1976

von

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## ABSTRACT

In the framework of studies which are concerned with "physical foundations of climate" the global budget of available potential and kinetic energy was considered by P. SPETH (1978). To interpret the results time-averaged fields of the temperature are required. Therefore 500 mb-distributions of mean temperature for each *January* and *July* of the period 1973 until 1976 (for these months the period 1967 until 1972 is given by P. SPETH, 1974) and for each *April* and *October* of the period 1967 until 1976 are presented. In addition mean meridional cross-sections of temperature are given for the same months. Moreover horizontal distributions of the available potential energy are presented, due to the large-scale mean standing and transient eddies.

## ZUSAMMENFASSUNG

Im Rahmen von Arbeiten über "Physikalische Grundlagen des Klimas" wurde der globale atmosphärische Haushalt der verfügbaren potentiellen und der kinetischen Energie von P. SPETH (1978) untersucht.

Zur Interpretation der Ergebnisse benötigt man zeitlich gemittelte Felder der Temperatur; dafür werden in der vorliegenden Arbeit die 500 mb Flächen für jeden Januar und Juli des Zeitraumes 1973 bis 1976 (für diese Monate ist der Zeitraum 1967 bis 1972 behandelt in P. SPETH, 1974) und für jeden April und Oktober des Zeitraumes 1967 bis 1976 herangezogen.

Zusätzlich werden mittlere Meridionalschnitte der Temperatur für dieselben Monate gezeigt.

Außerdem werden horizontale Verteilungen der verfügbaren potentiellen Energie präsentiert, die durch großskalige stehende und wandernde Wellen hervorgerufen werden.

*The following symbols are used:*

$A_{MSE}$                       the available potential energy produced  
by the mean standing eddies

$A_{TE}$                         the available potential energy produced  
by the transient eddies

$[T] (t)$                     time average of temperature

$[T] (\lambda)$                 zonal mean value of temperature

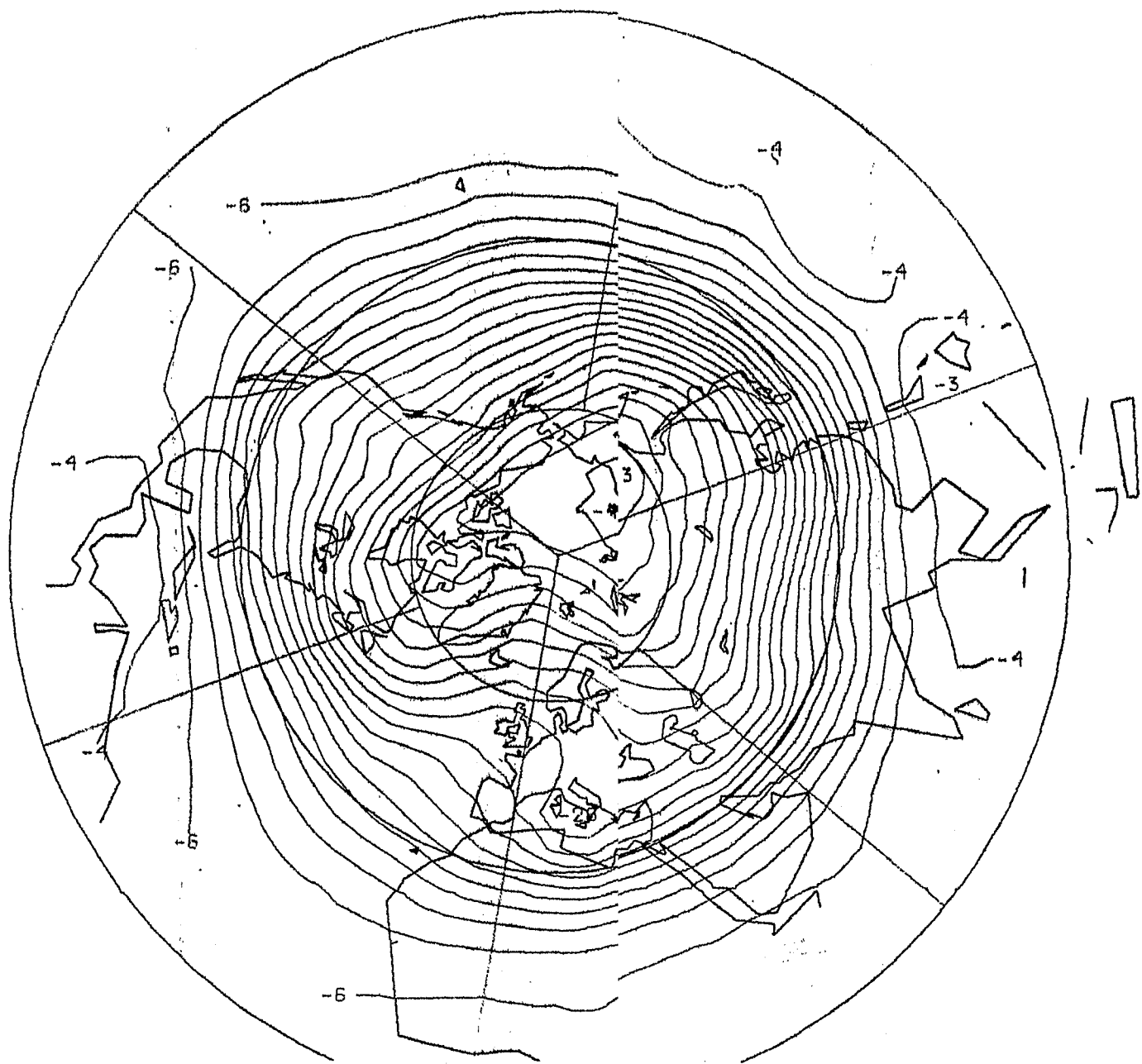
#### REFERENCES

Speth, P.,                      Mean meridional cross-sections of the  
available potential energy for each  
January and July of the period 1973  
until 1976

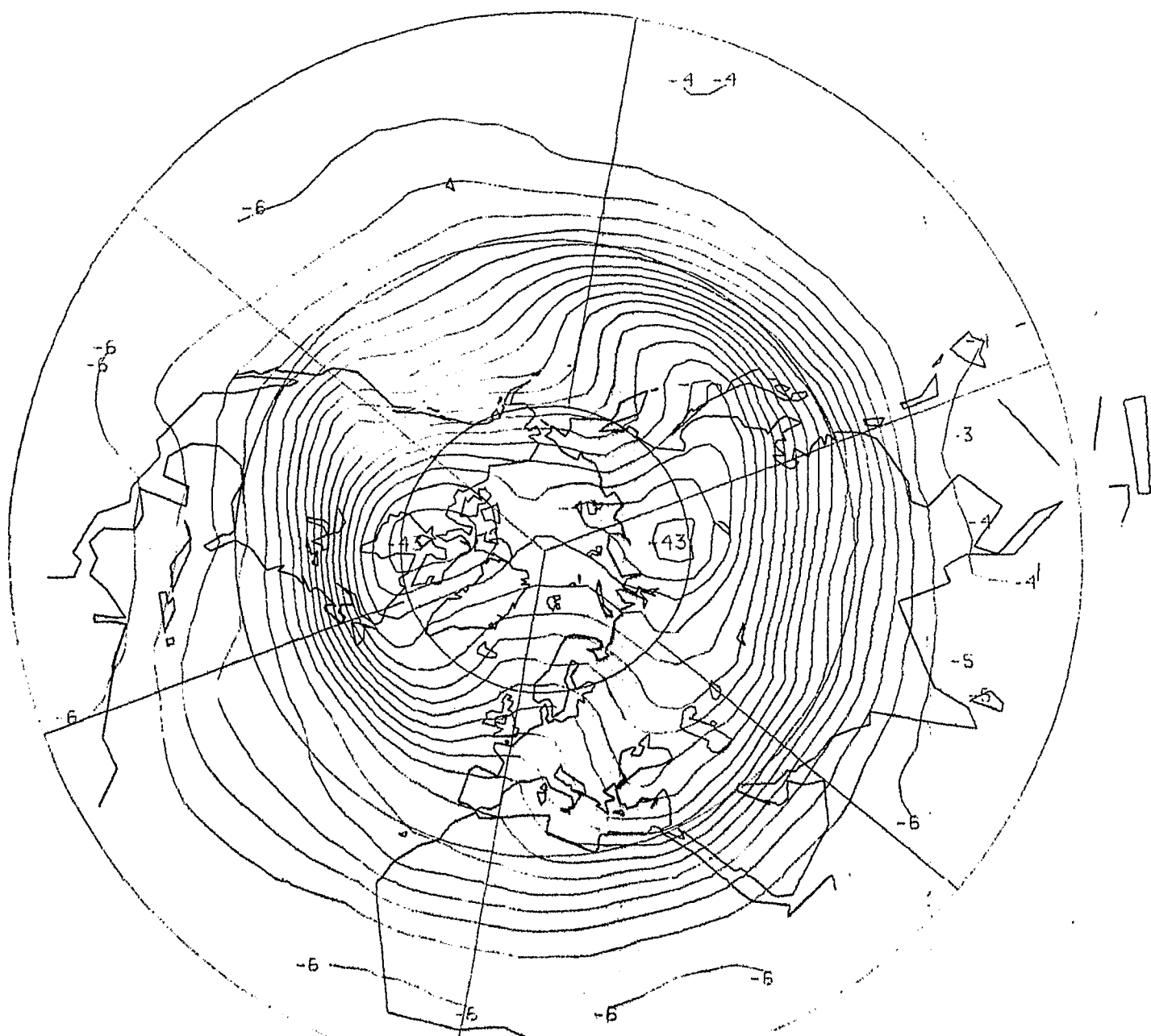
Speth, P.,                      Mittlere Horizontalverteilungen der  
Temperatur und der verfügbaren potentiell-  
len Energie und mittlere Meridionalschnit-  
te der Temperatur für jeden Januar und  
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Berichte IfM Kiel Nr. 3, 1974

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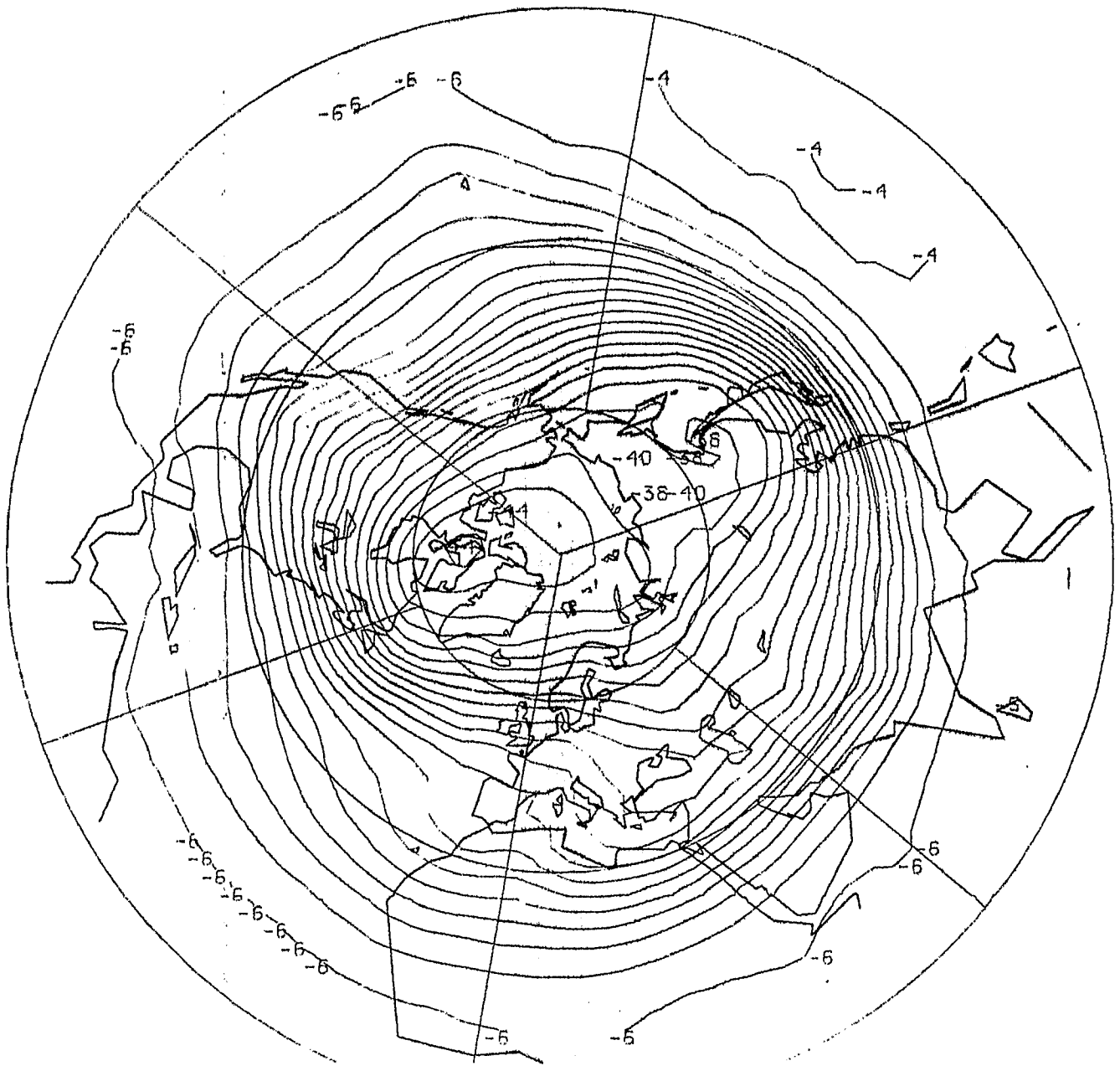
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$[T]_{(t)}$  500 mb JAN. 73

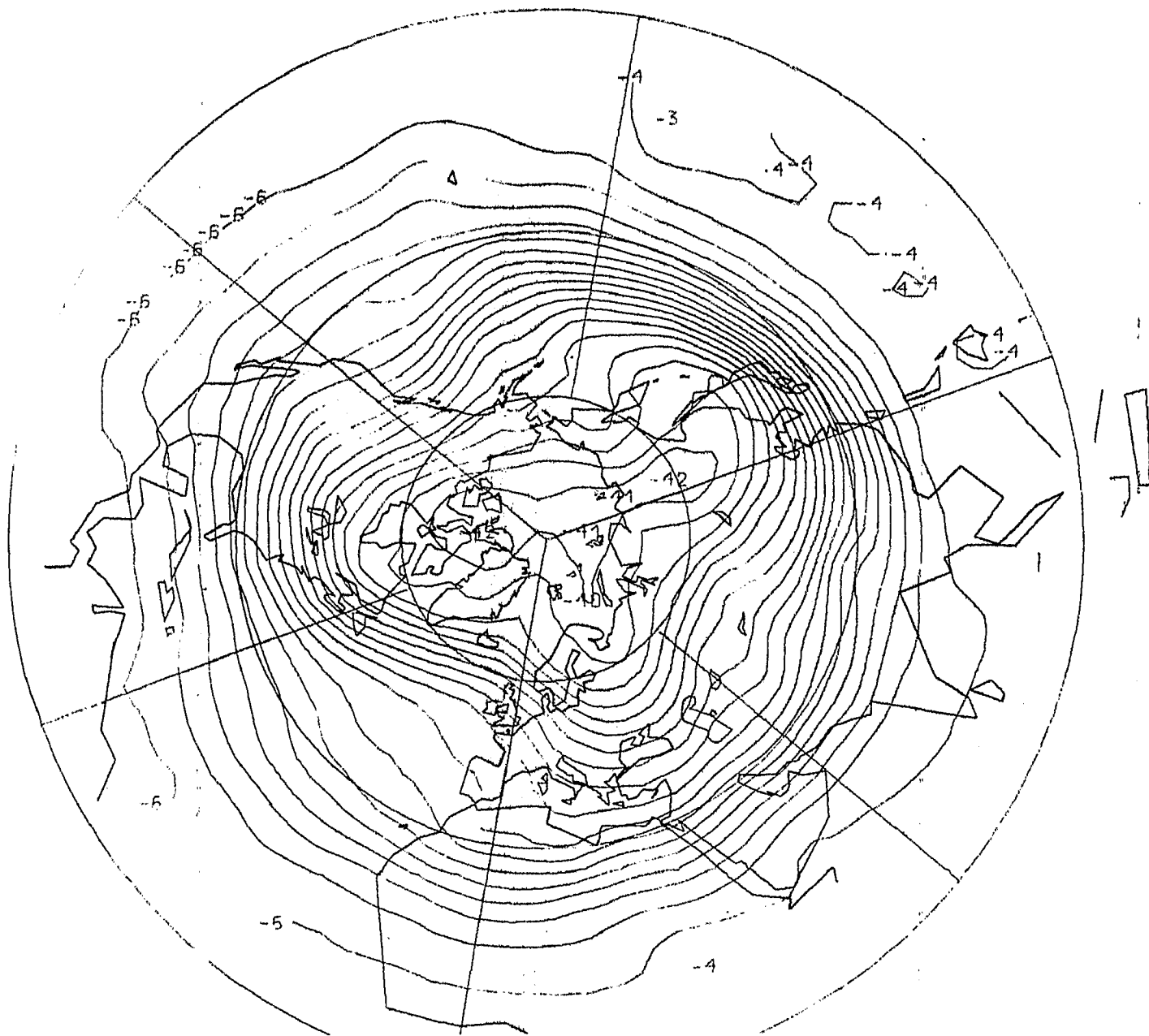


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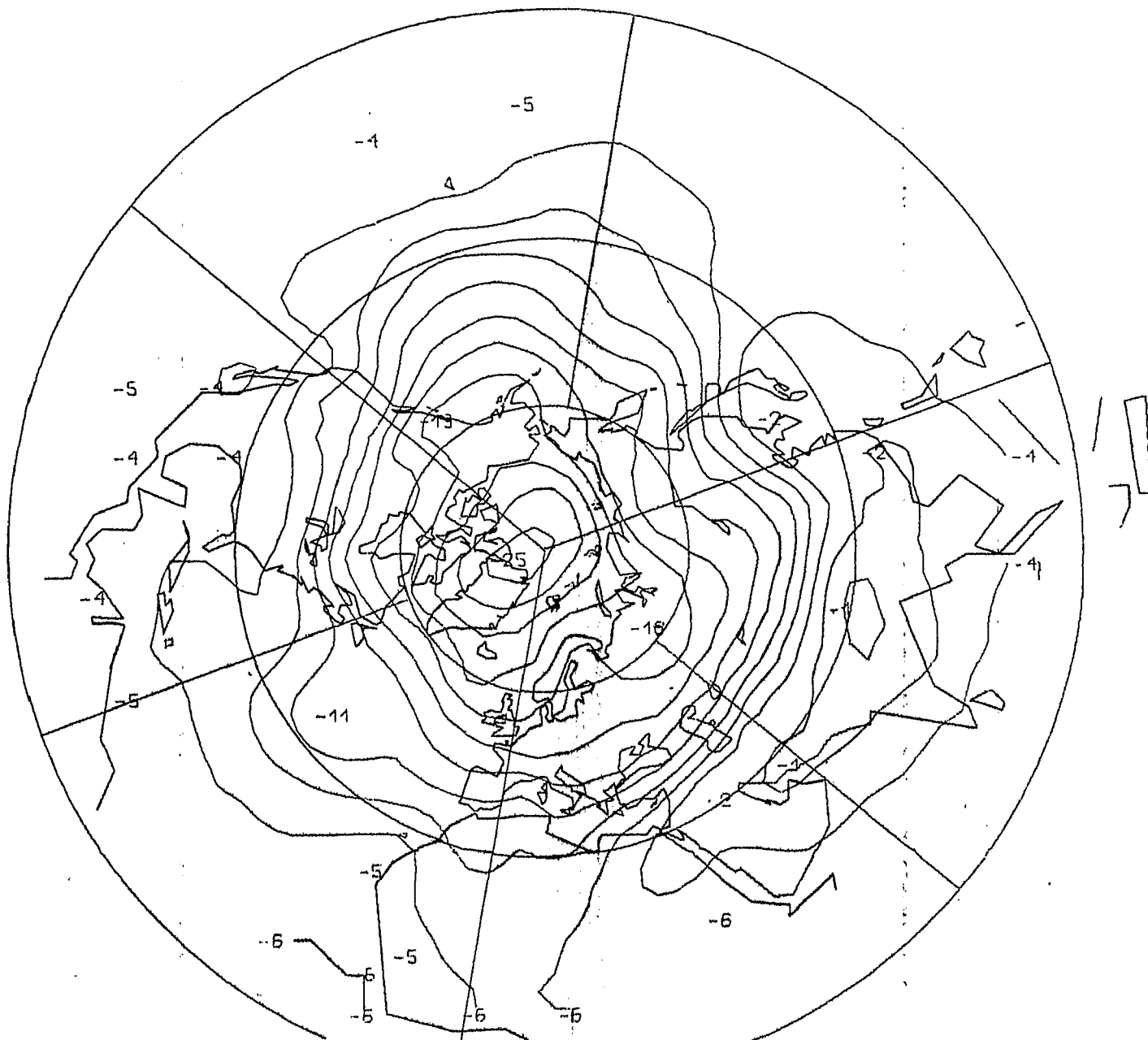


$[T]_{(t)}$  500 mb JAN. 75





$[T]_{(t)}$  500 mb JAN.76

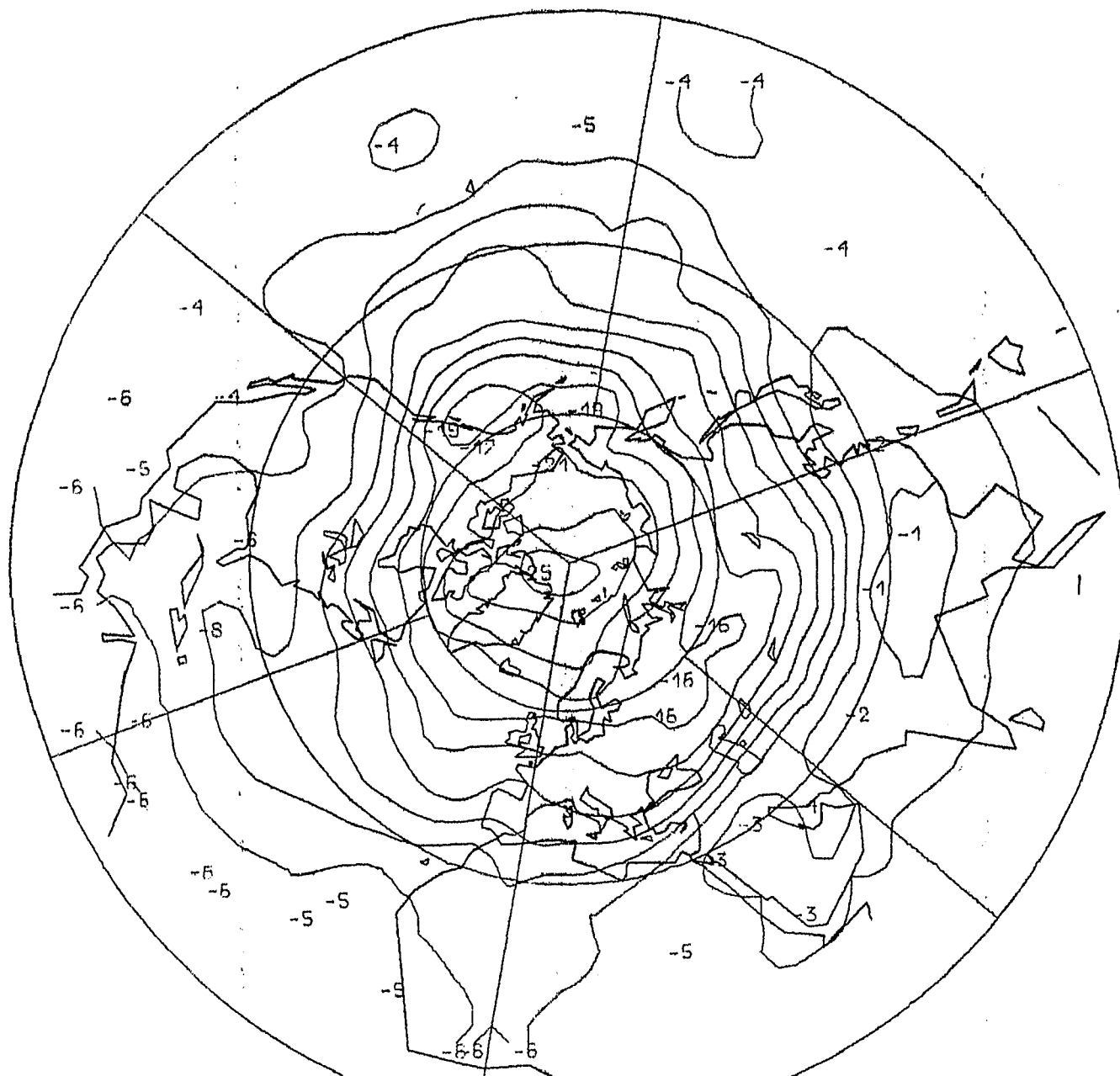


$[\tau]_{(t)}$

500 mb

JULY 73

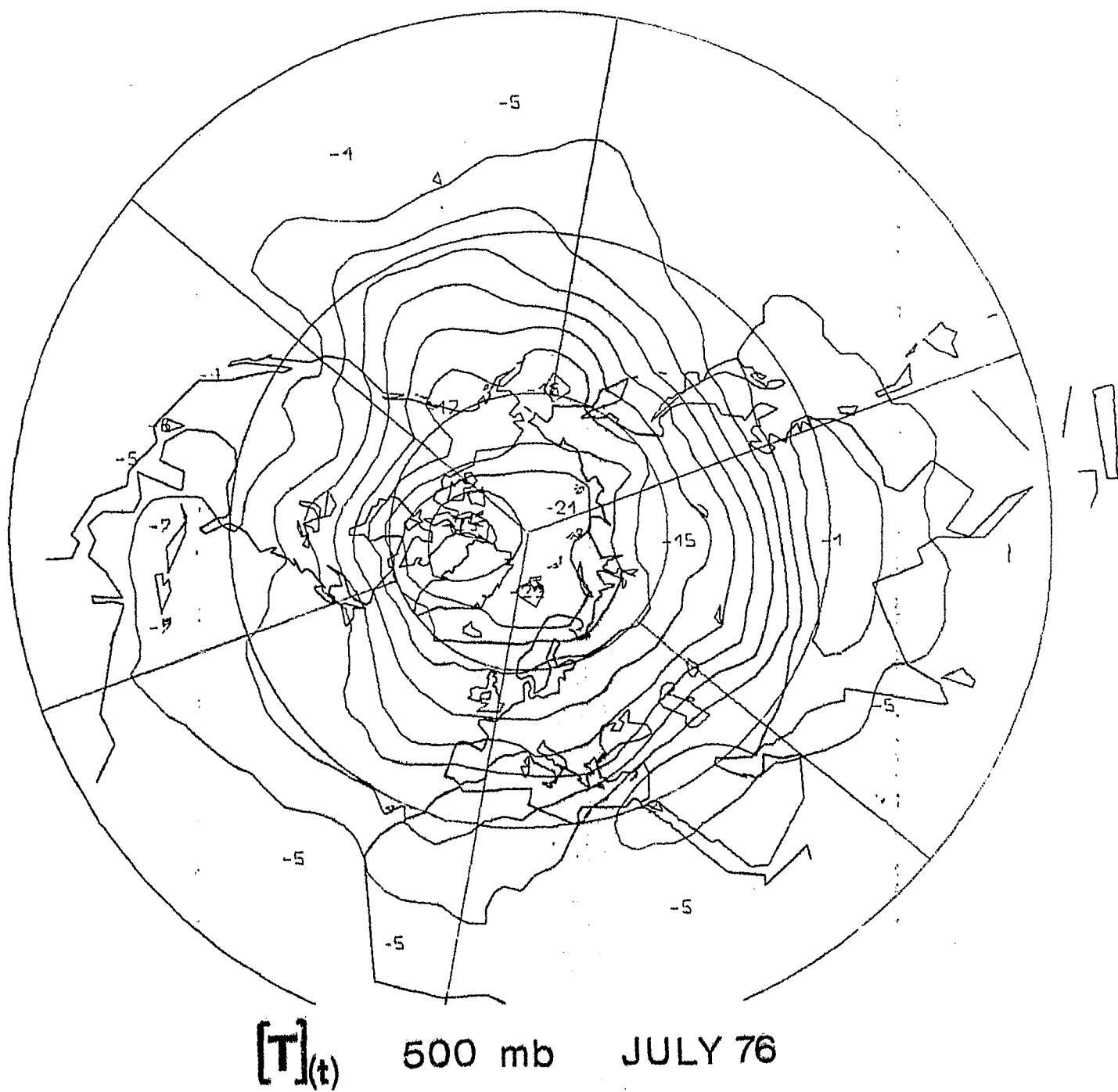


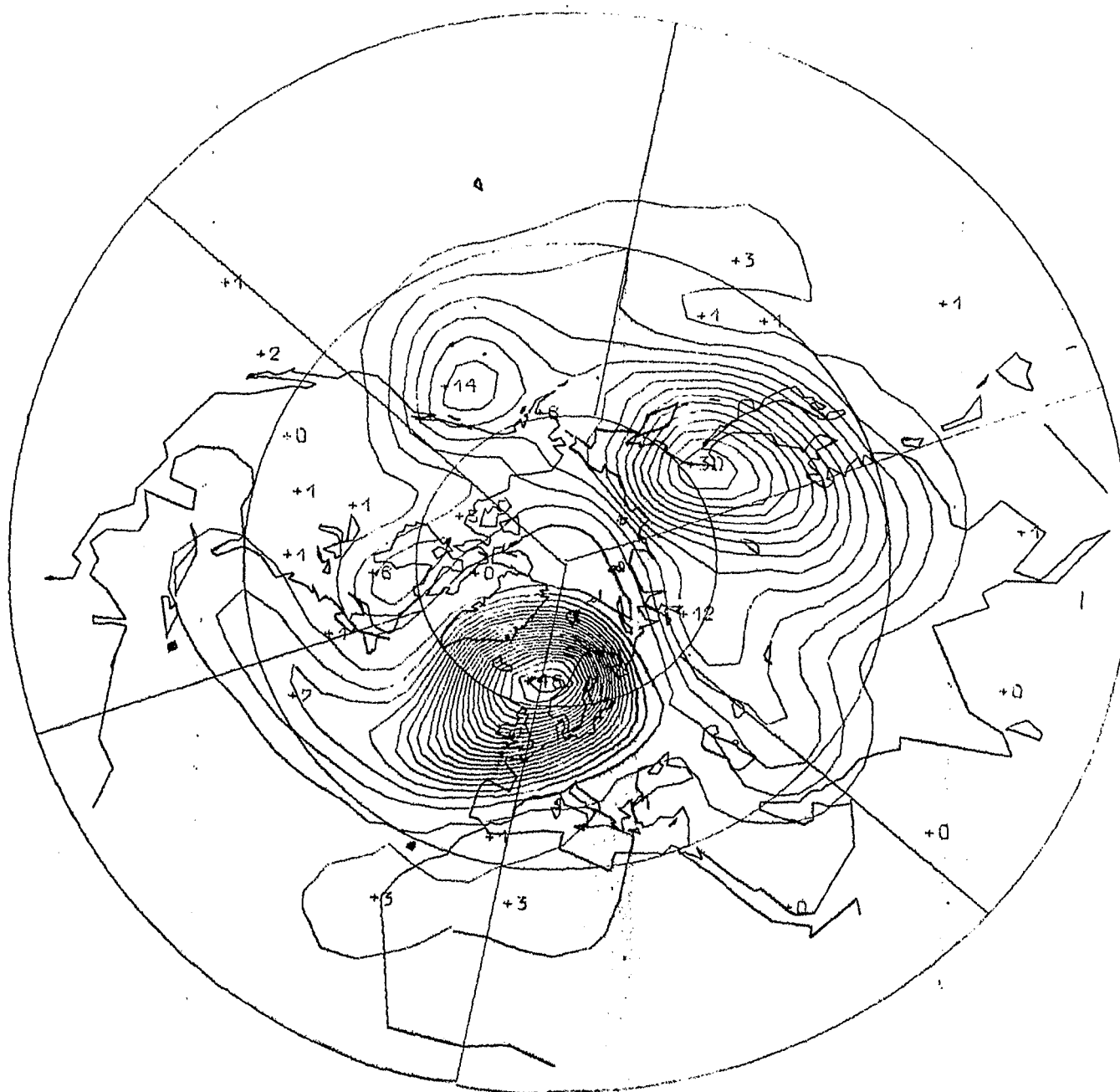


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JULY

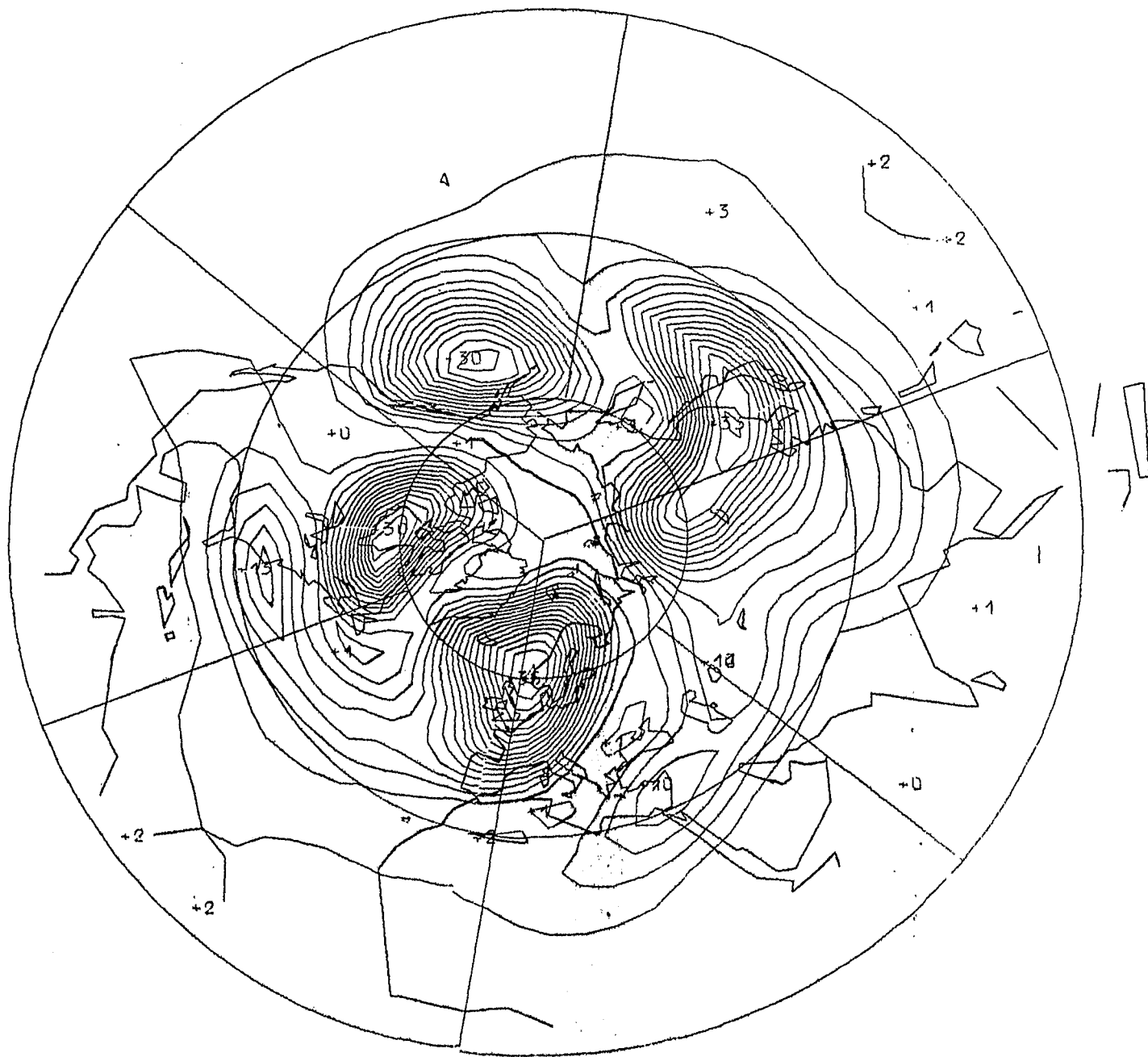




**A<sub>MSE</sub> JAN. 1973**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

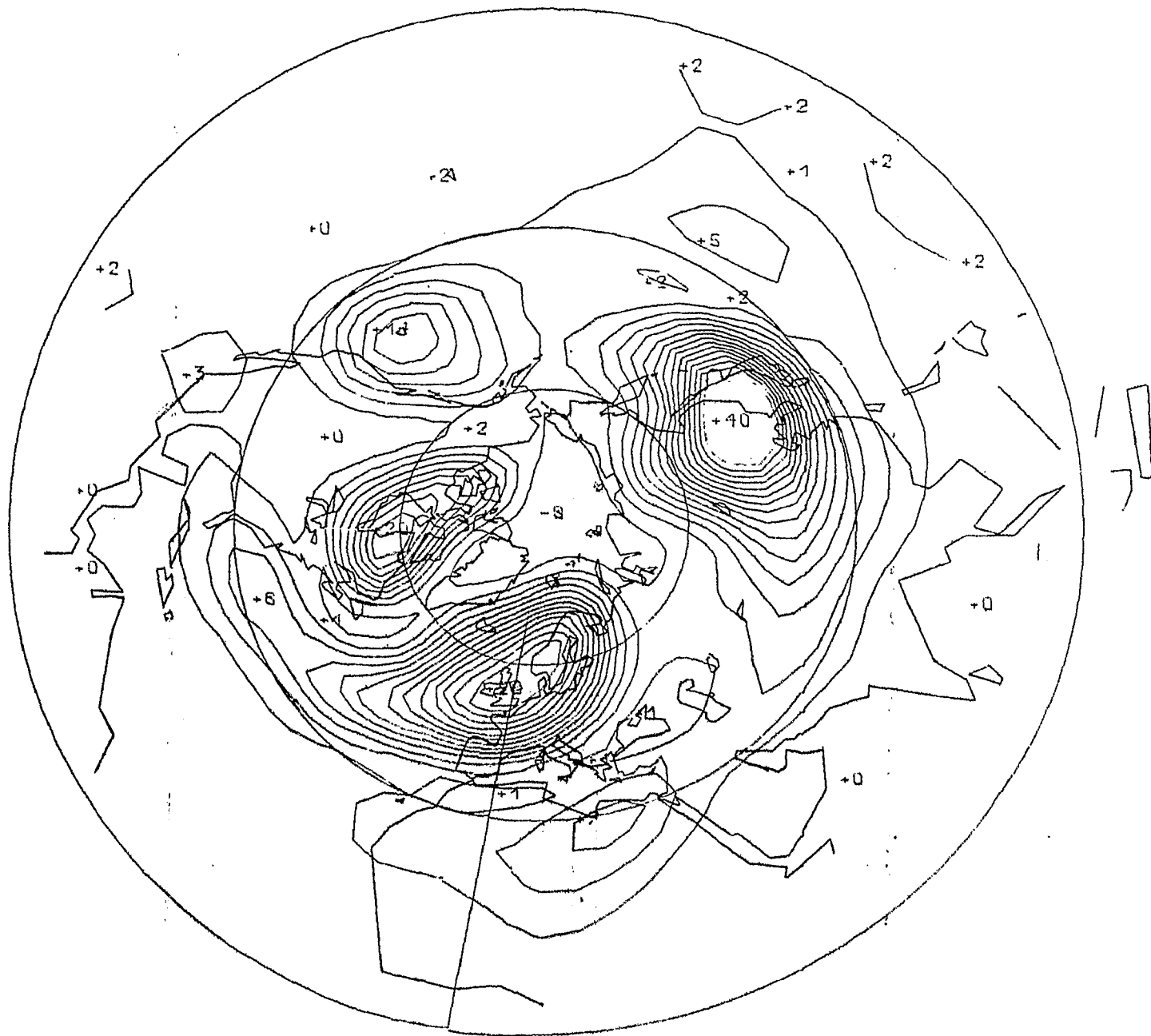
Abb. 9



**A<sub>MSE</sub>** JAN. 1974

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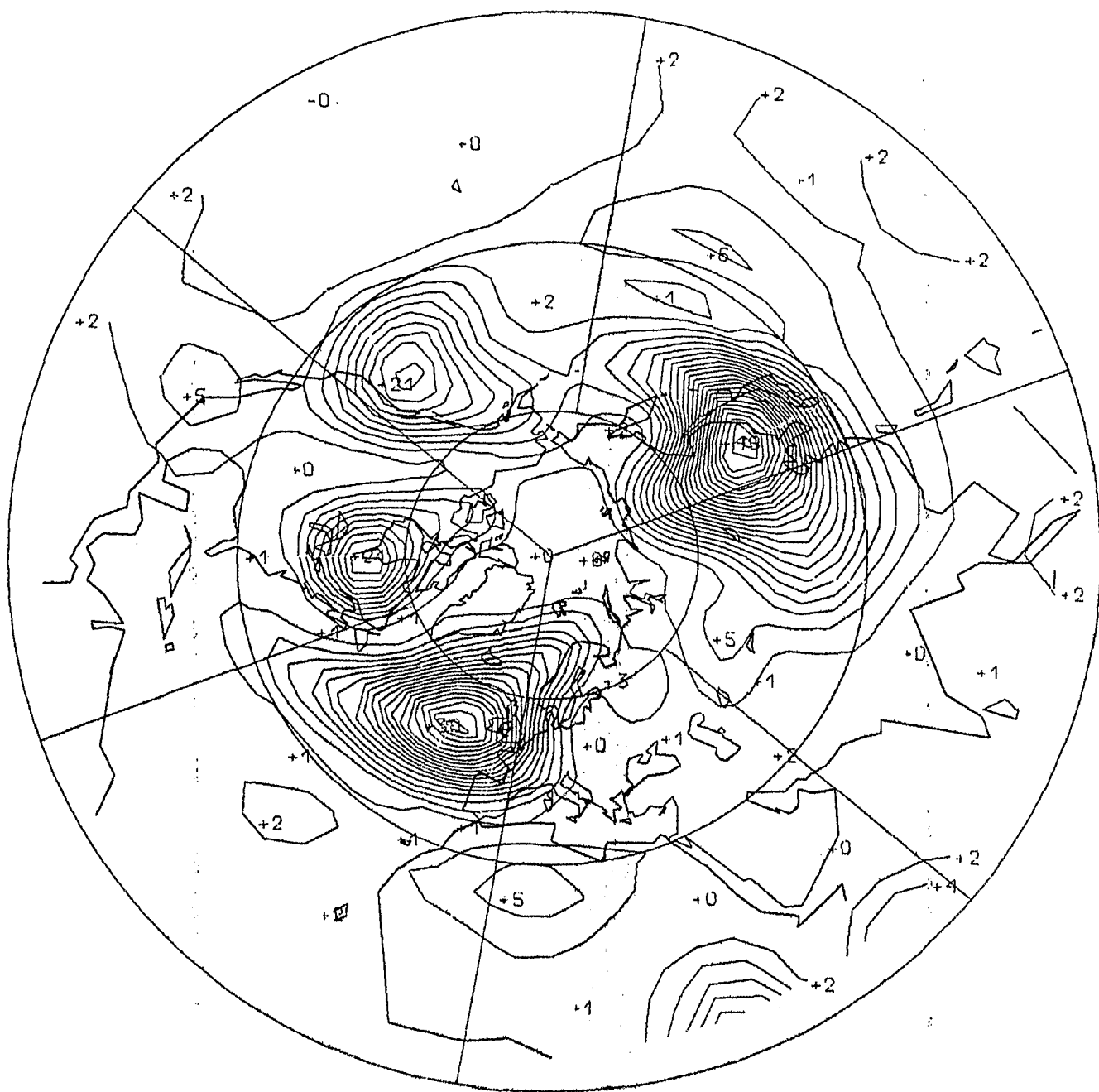
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**A<sub>MSE</sub>** JAN. 1975

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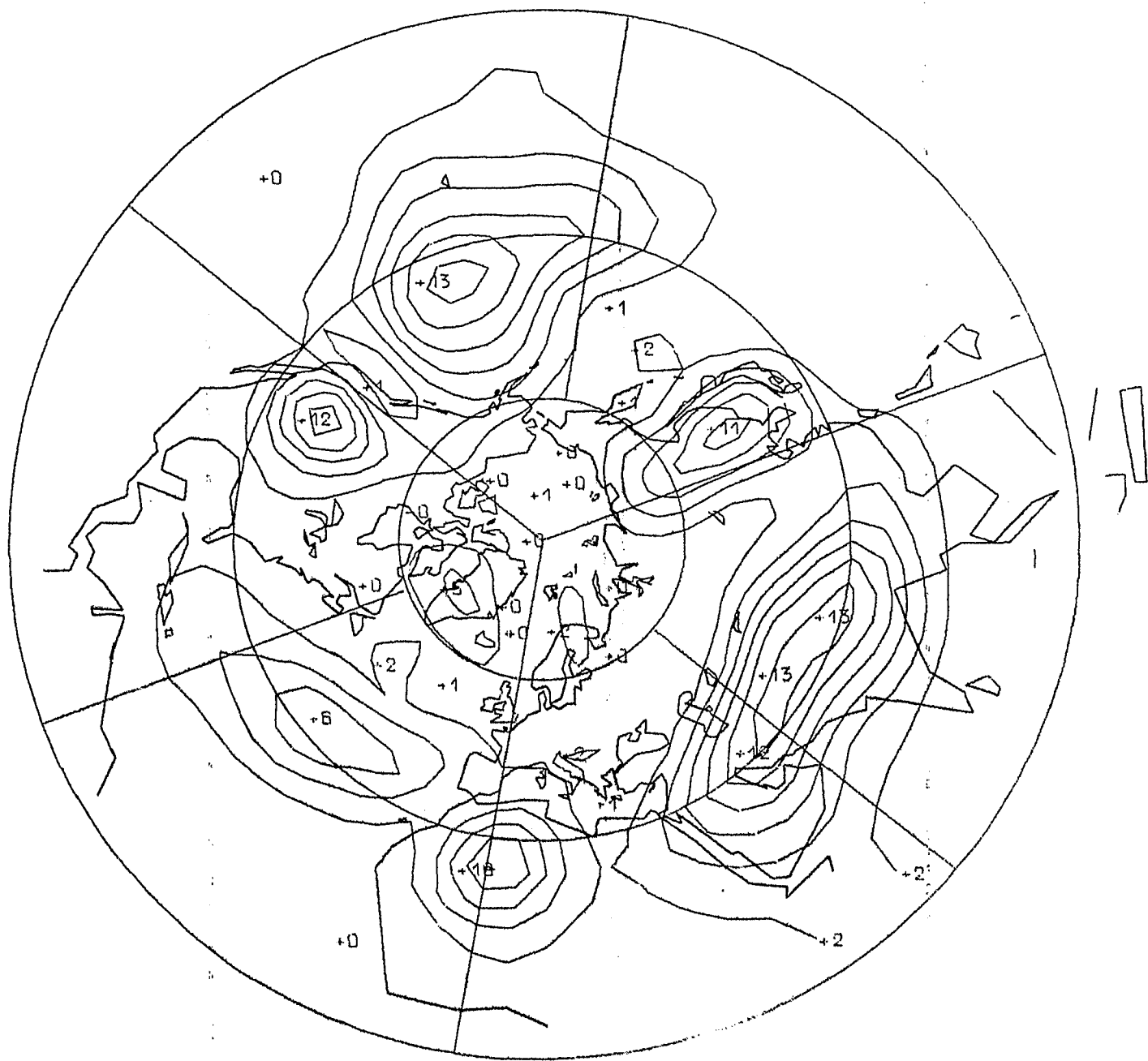




**A<sub>MSE</sub> JAN. 1976**

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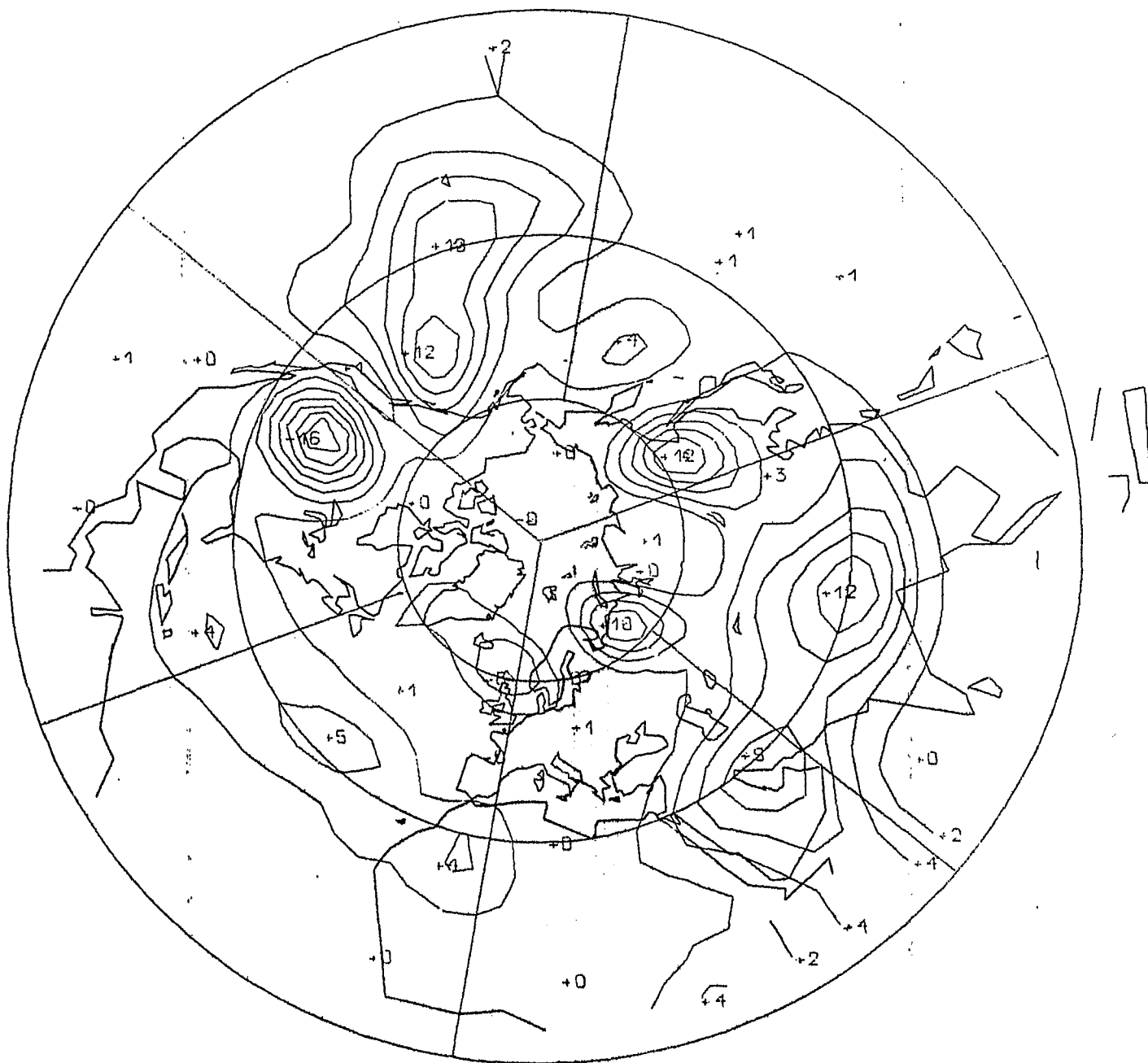
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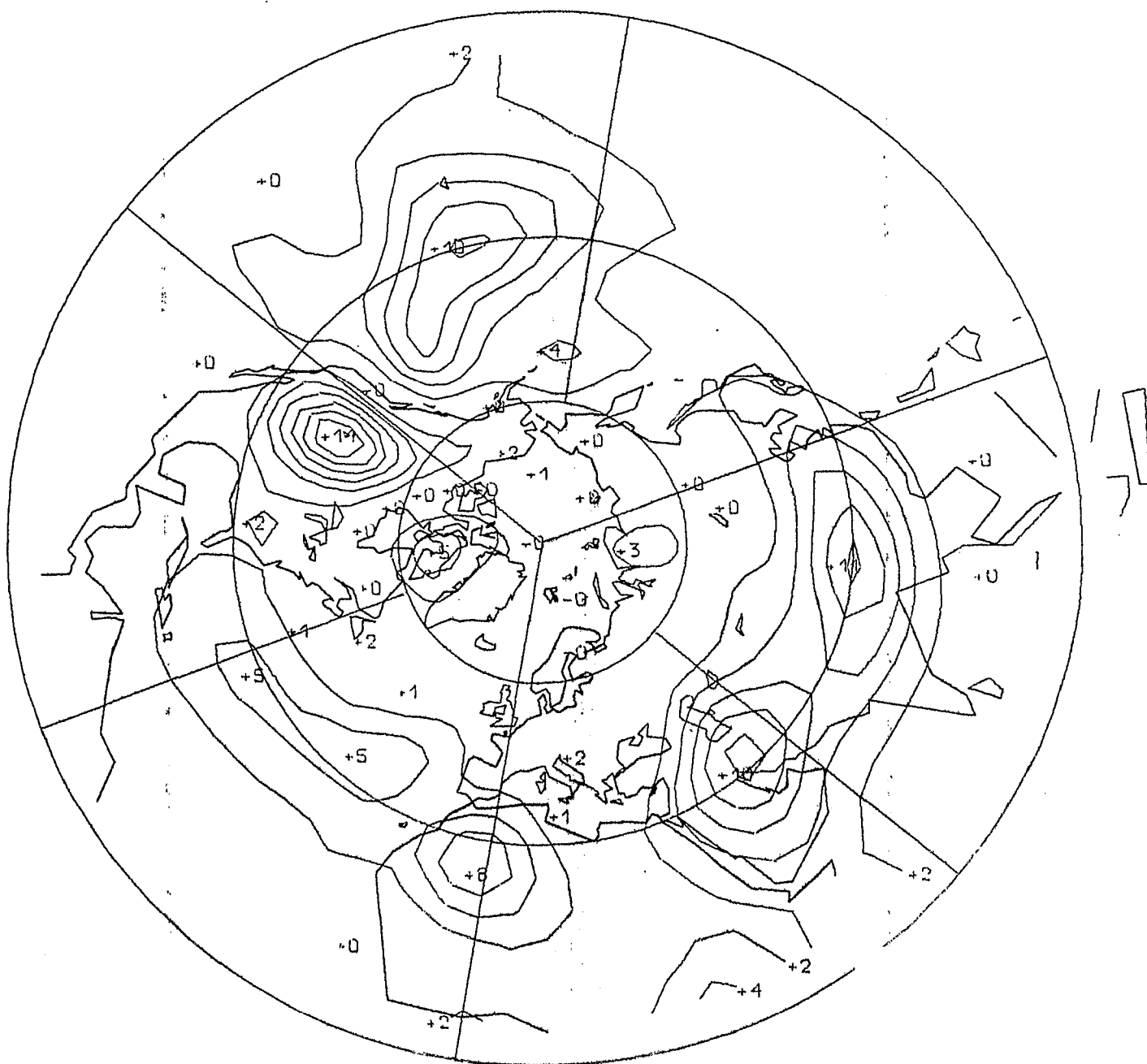
Abb.13



**A<sub>MSE</sub> JULY 1974**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.14



**A<sub>MSE</sub>** JULY 1975

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.15

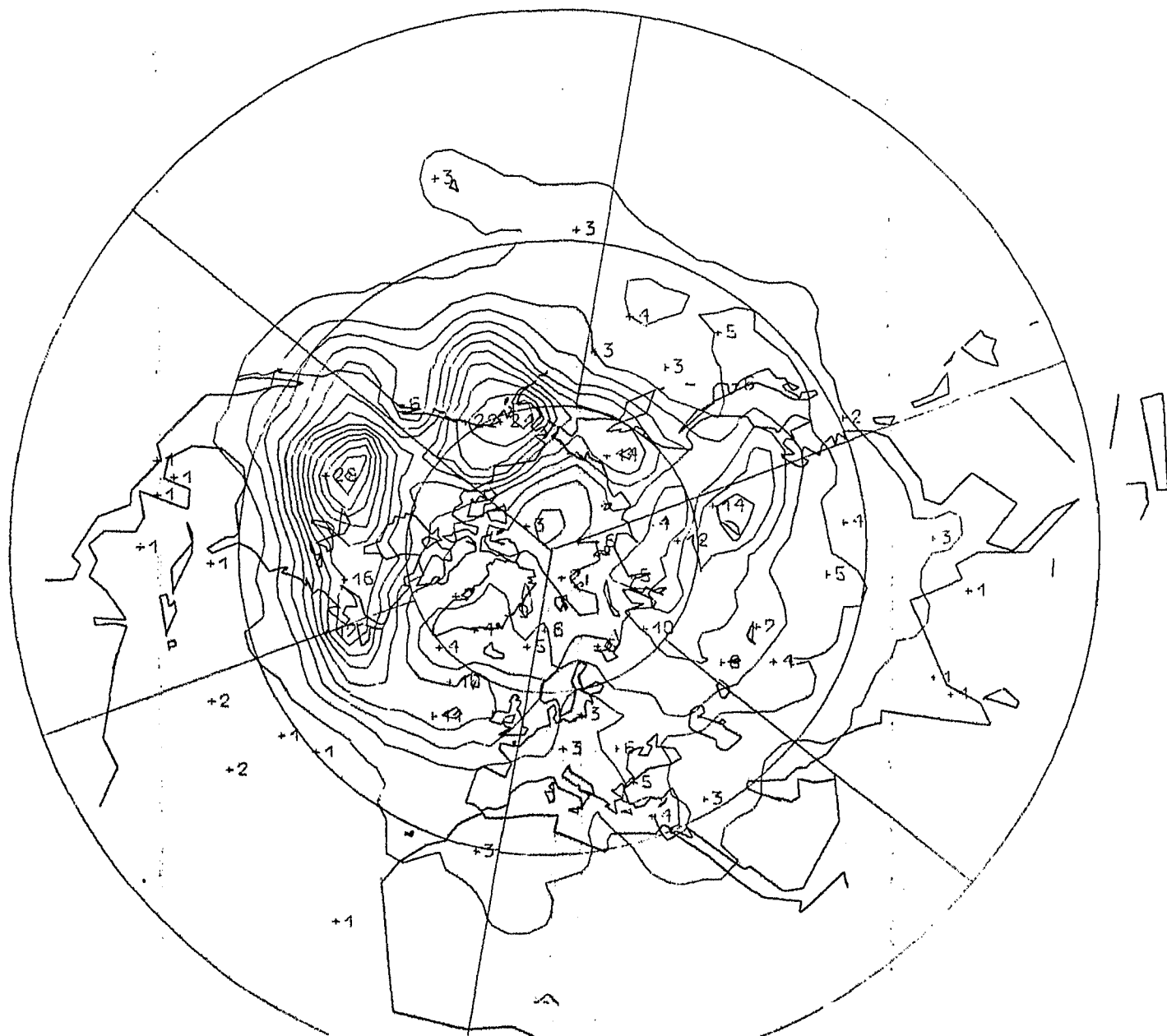


**A<sub>MSE</sub> JULY 1976**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

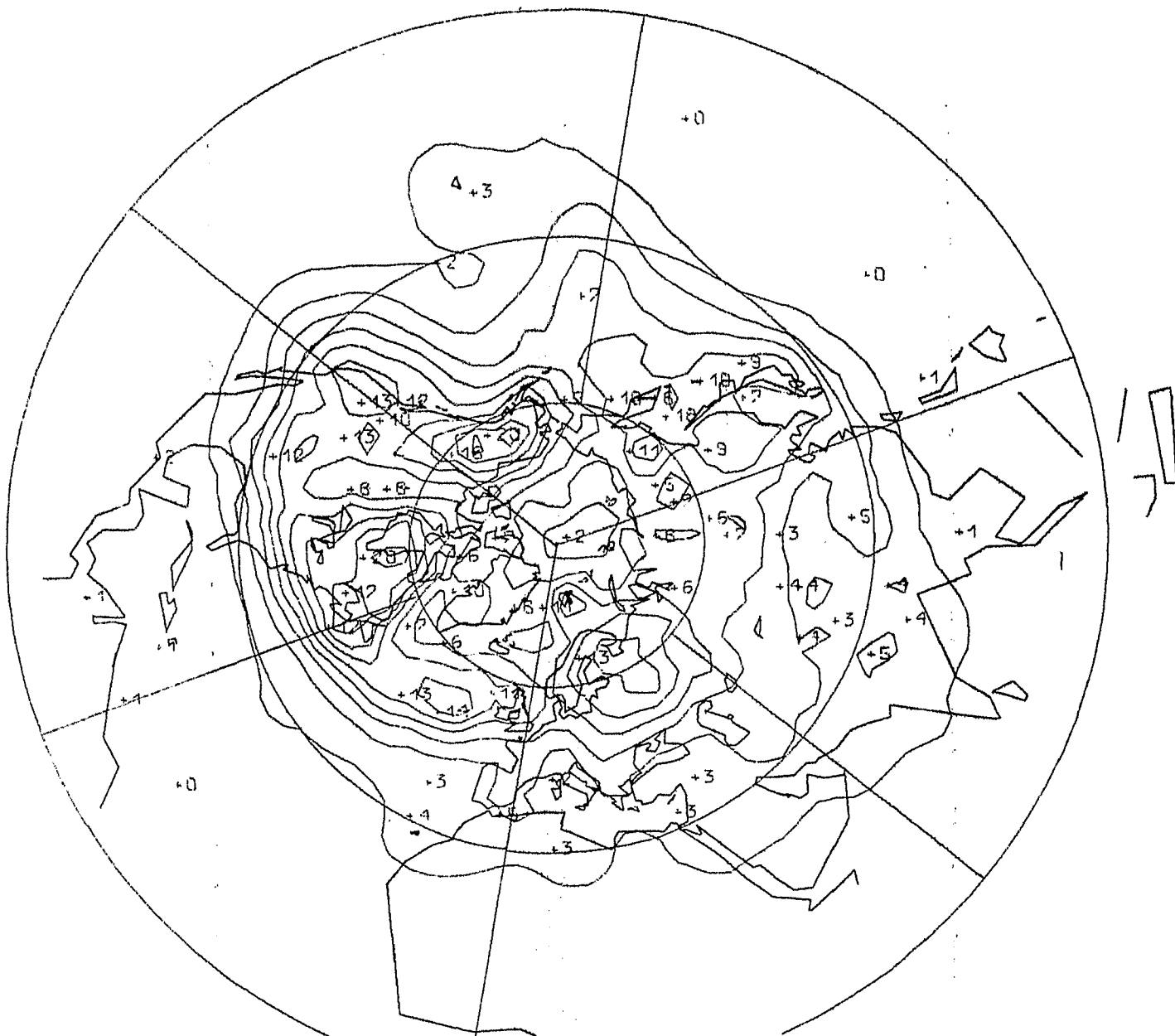
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**A<sub>TE</sub>** JAN. 1974

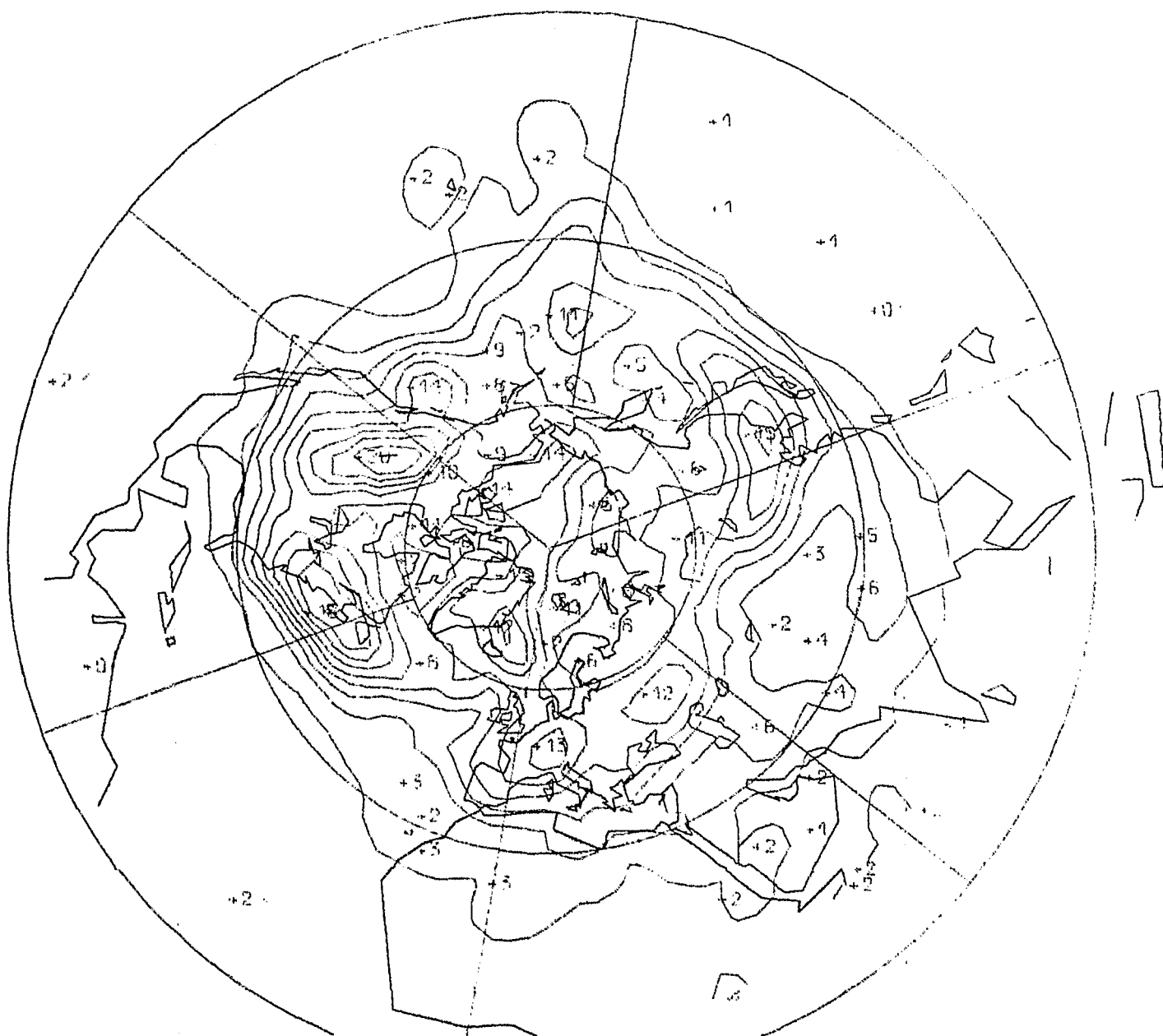
**$10^{-2}$  J CM<sup>-2</sup> MB<sup>-1</sup>**



**A<sub>TE</sub>** JAN. 1975

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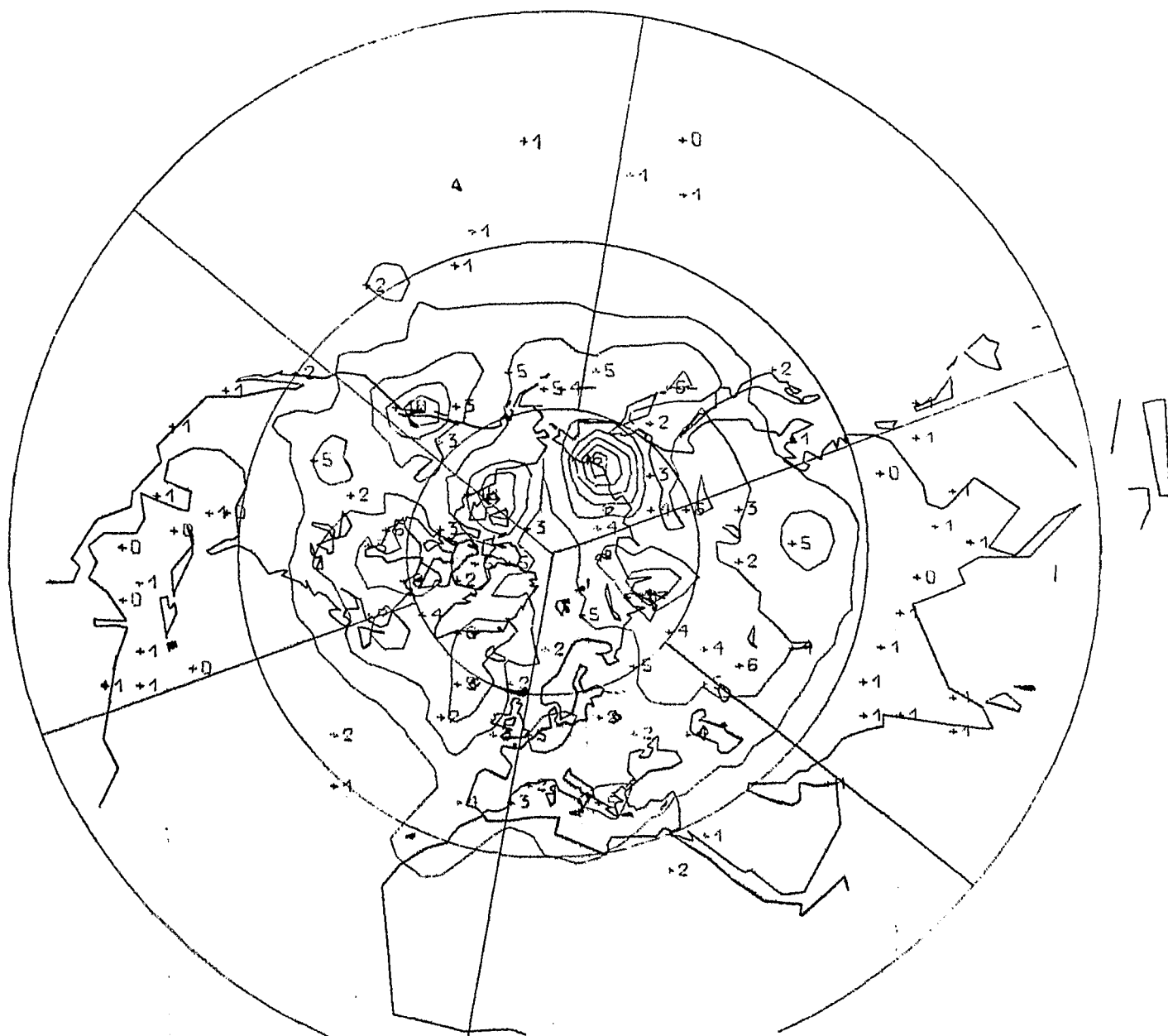




**A<sub>TE</sub>**

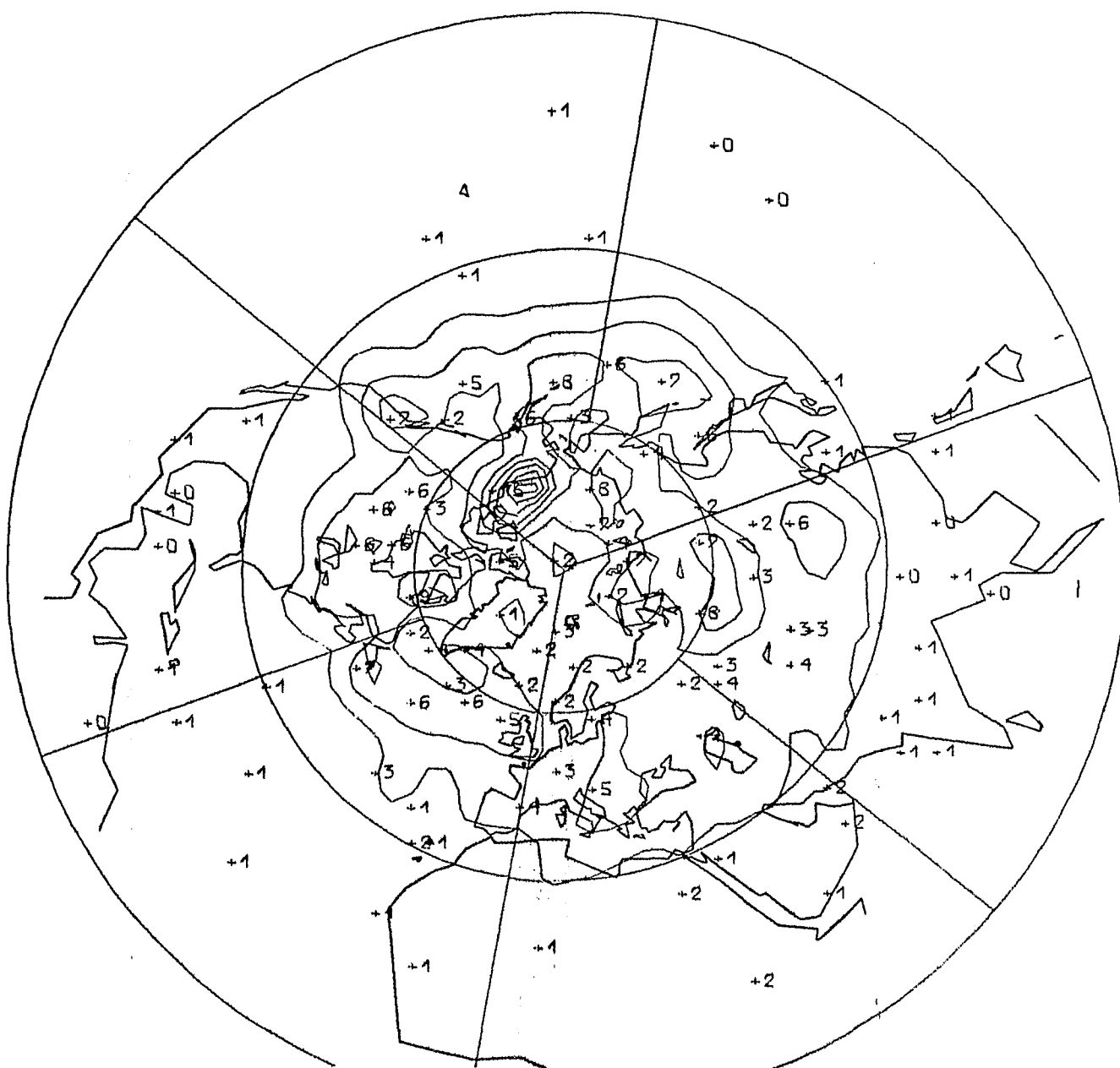
**JAN. 1976**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**



**A<sub>TE</sub> JULY 1973**  
 **$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

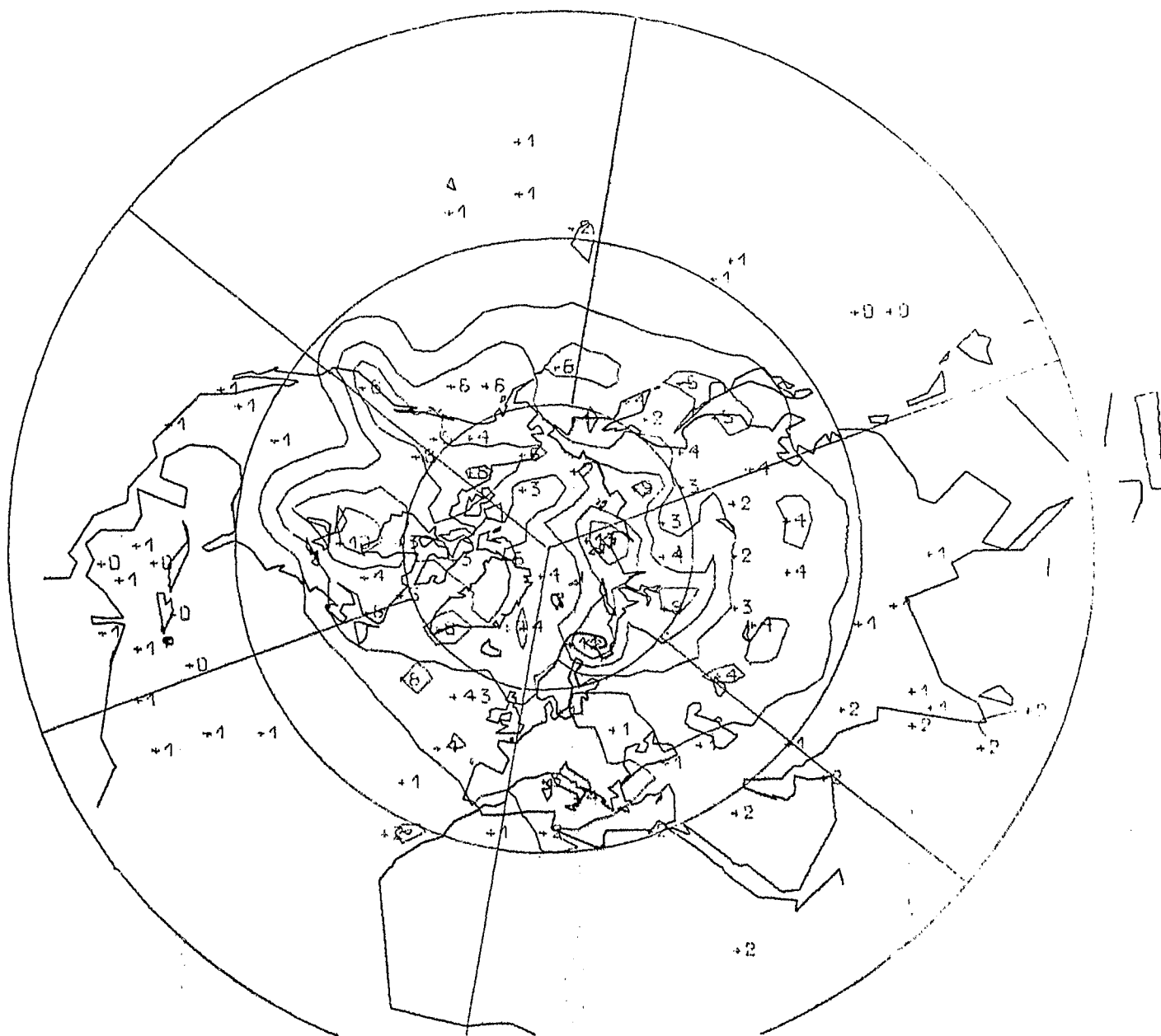
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**A<sub>TE</sub>** JULY 1974

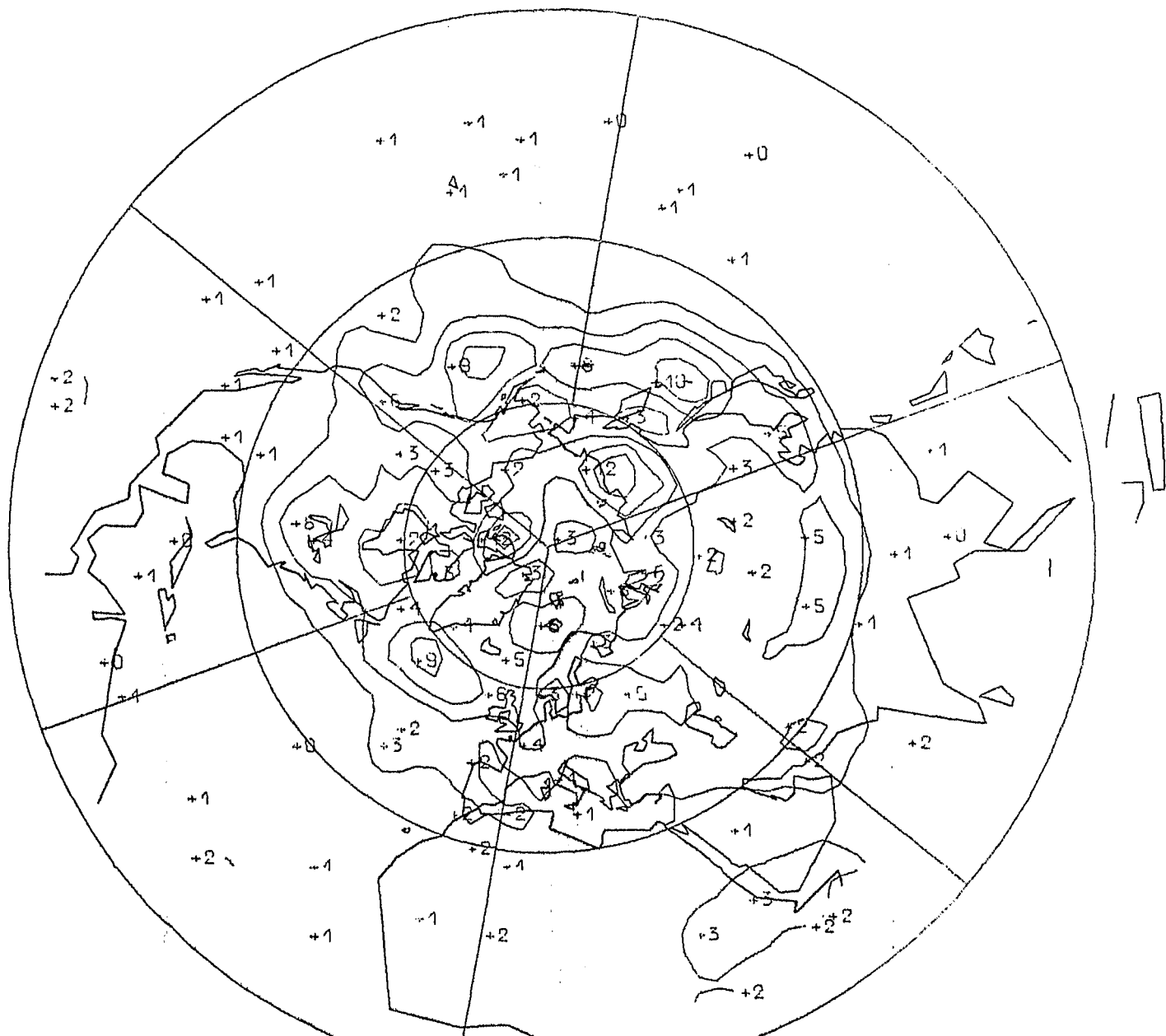
**$10^{-2}$  J CM<sup>-2</sup> MB<sup>-1</sup>**

Abb.22



**A<sub>TE</sub>**      JULY 1975  
**10<sup>-2</sup> J CM<sup>-2</sup> MB<sup>-1</sup>**

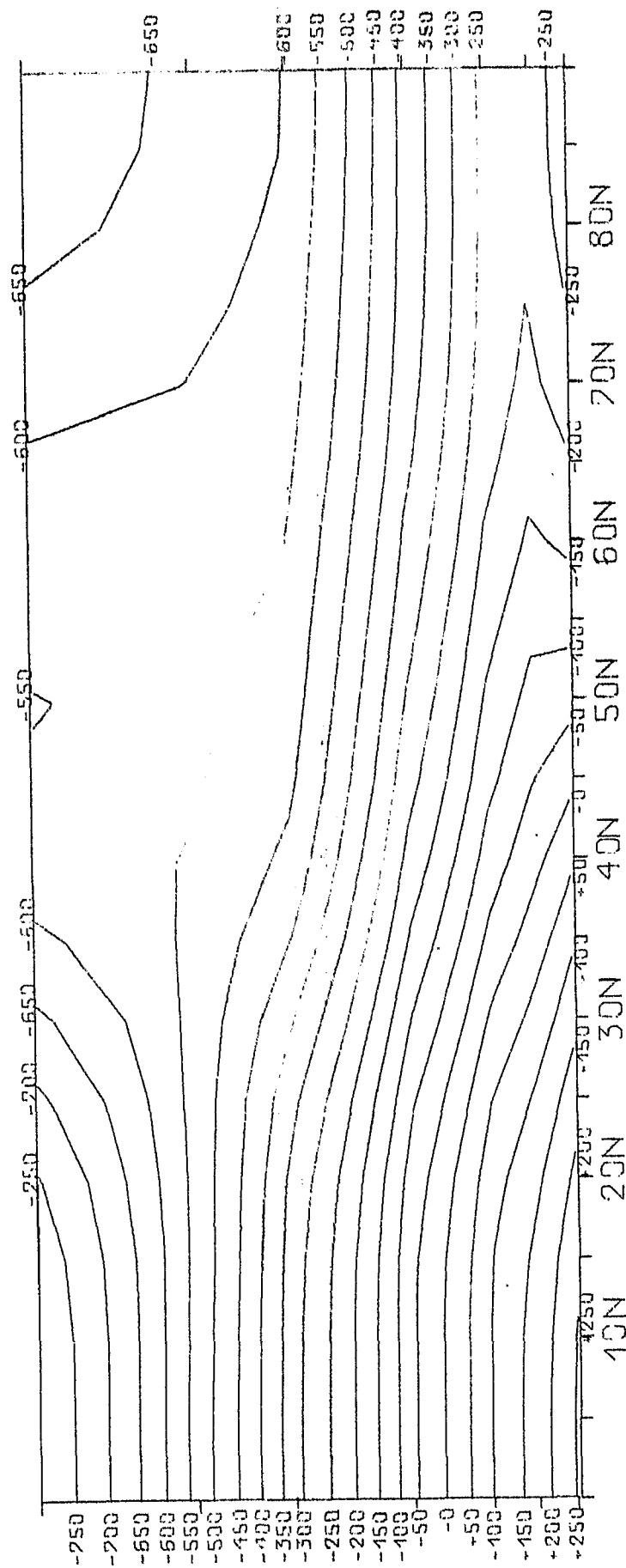
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**A<sub>TE</sub> JULY 1976**

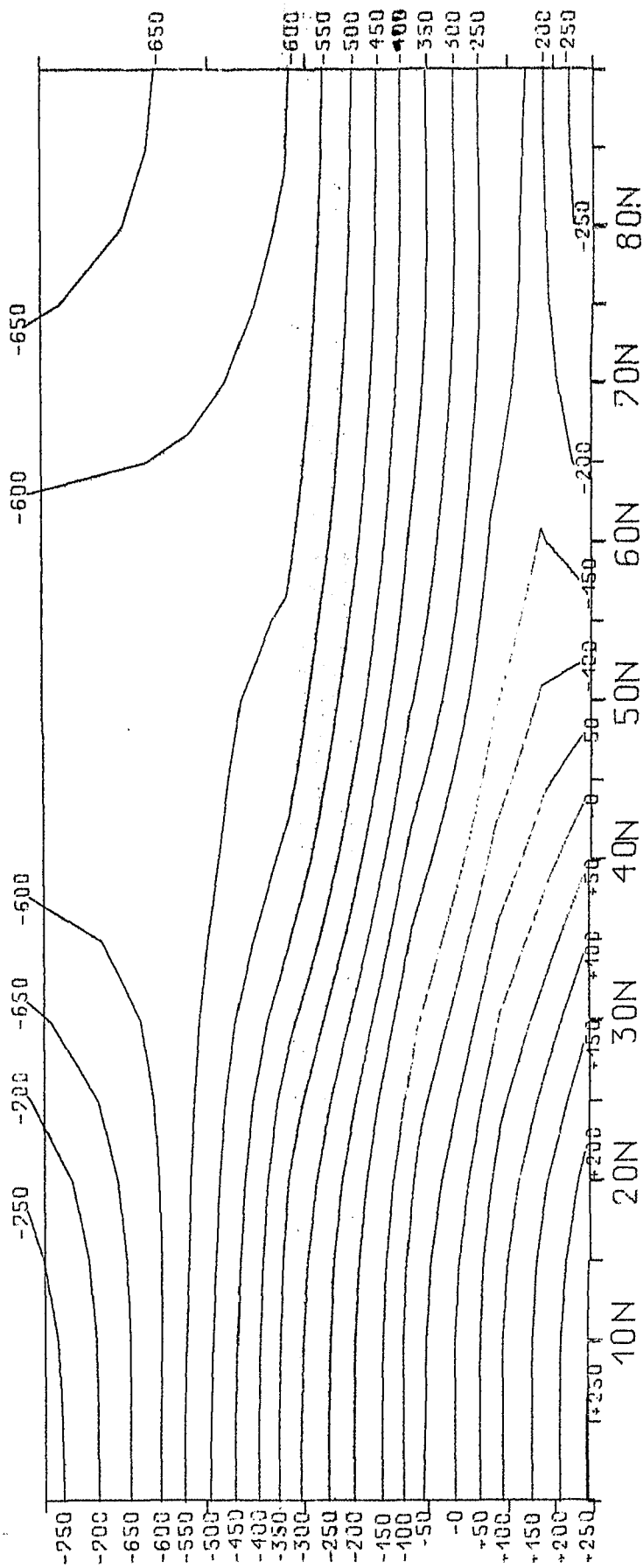
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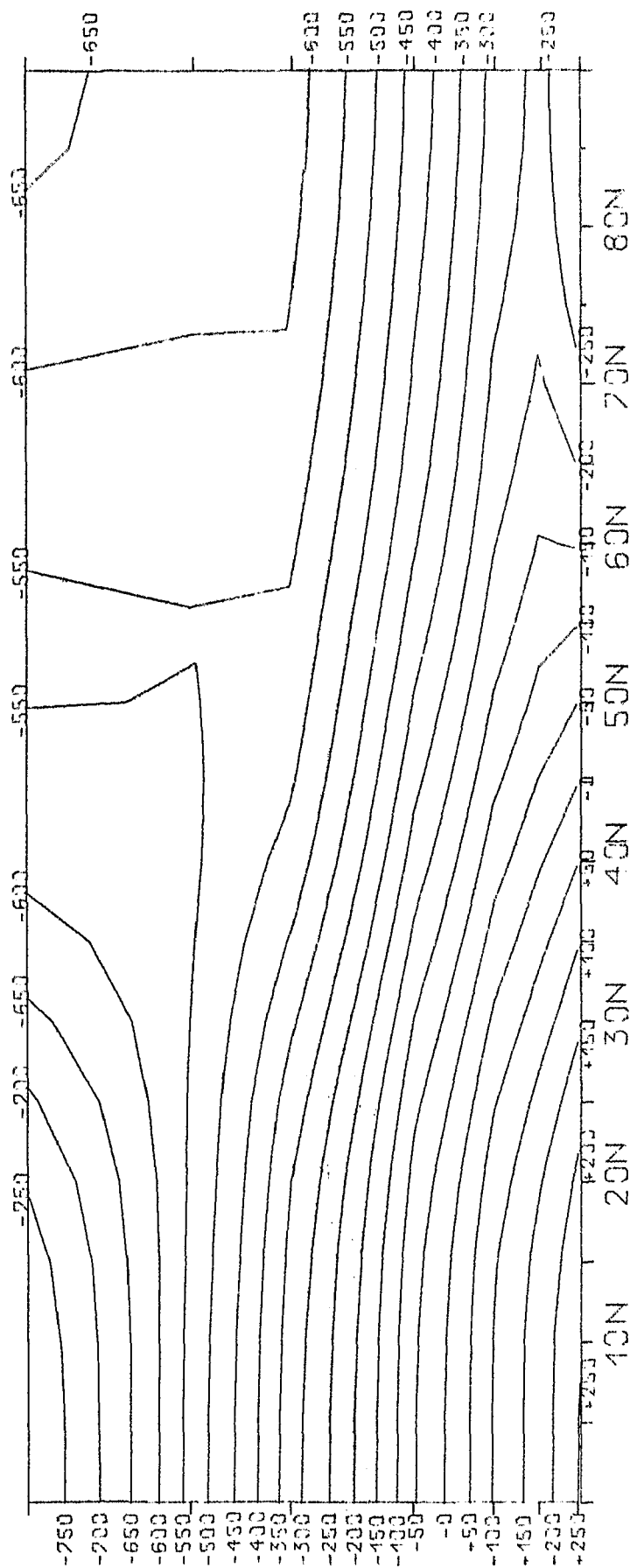
$[T]_{(\lambda)}$  IN  $1/10$  GRAD C JAN.73

KENNZIFFER: 34017400



$[T]_{(\lambda)}$  IN 1/10 GRAD C JAN.74

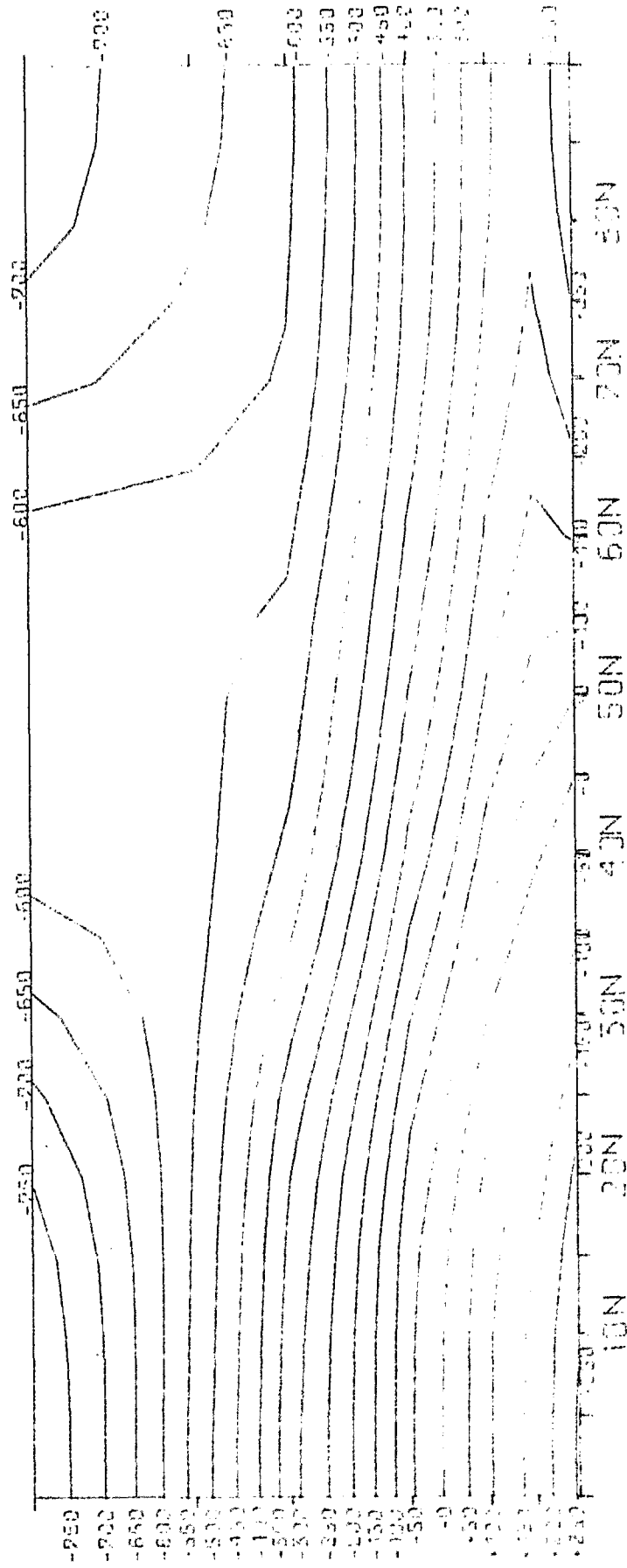
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$[T]_{(\lambda)}$  IN 1/10 GRAD C JAN.75

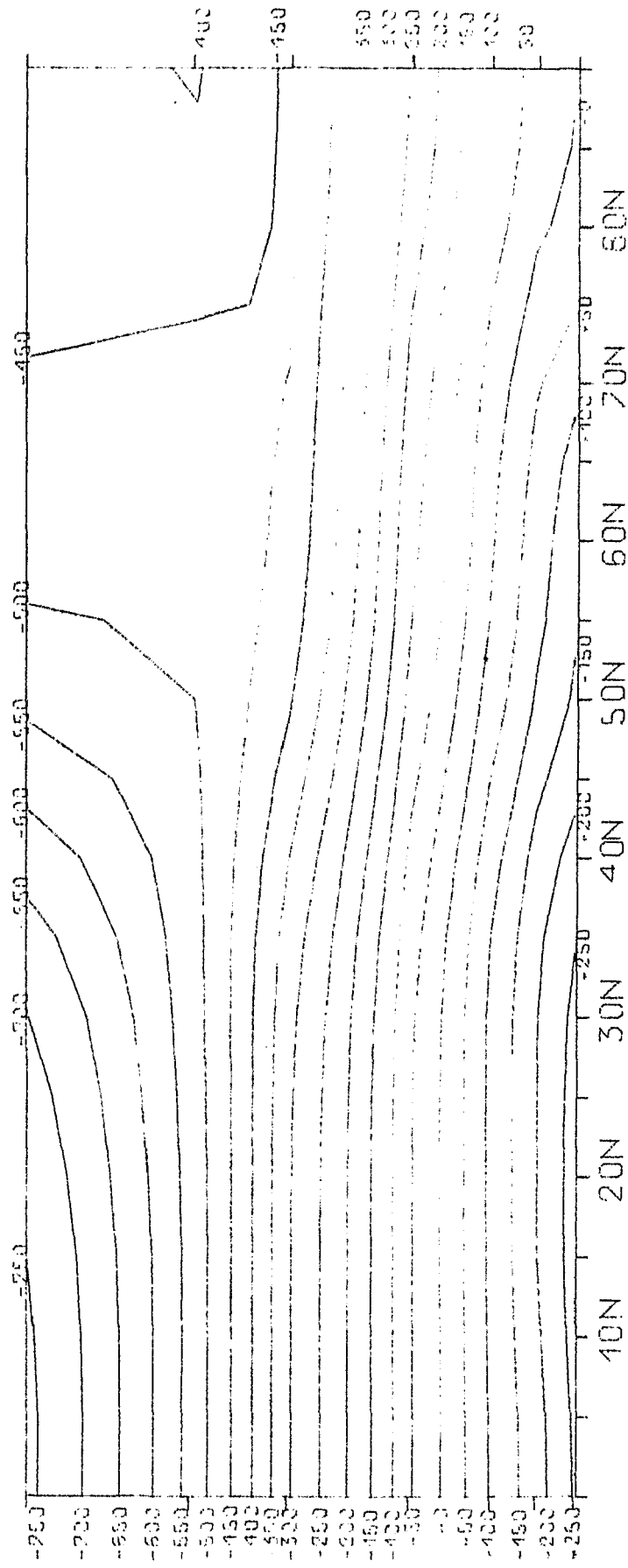


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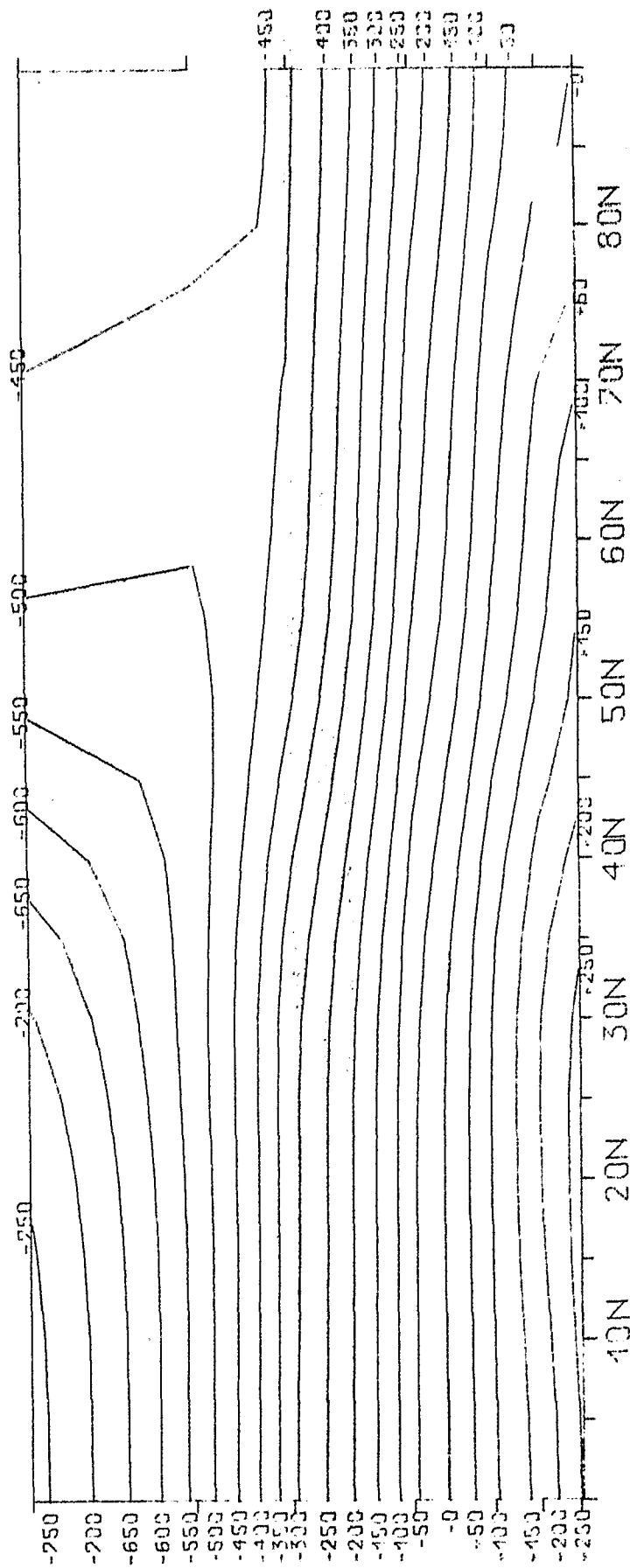
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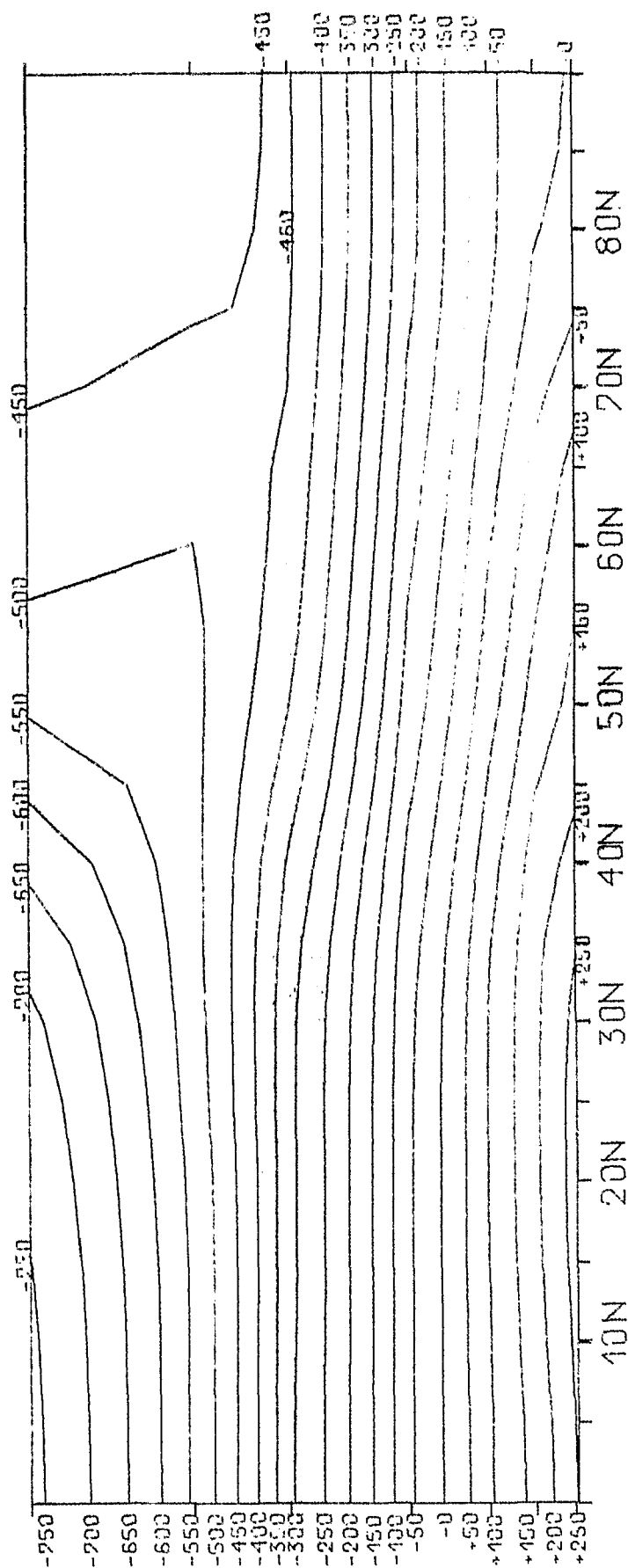
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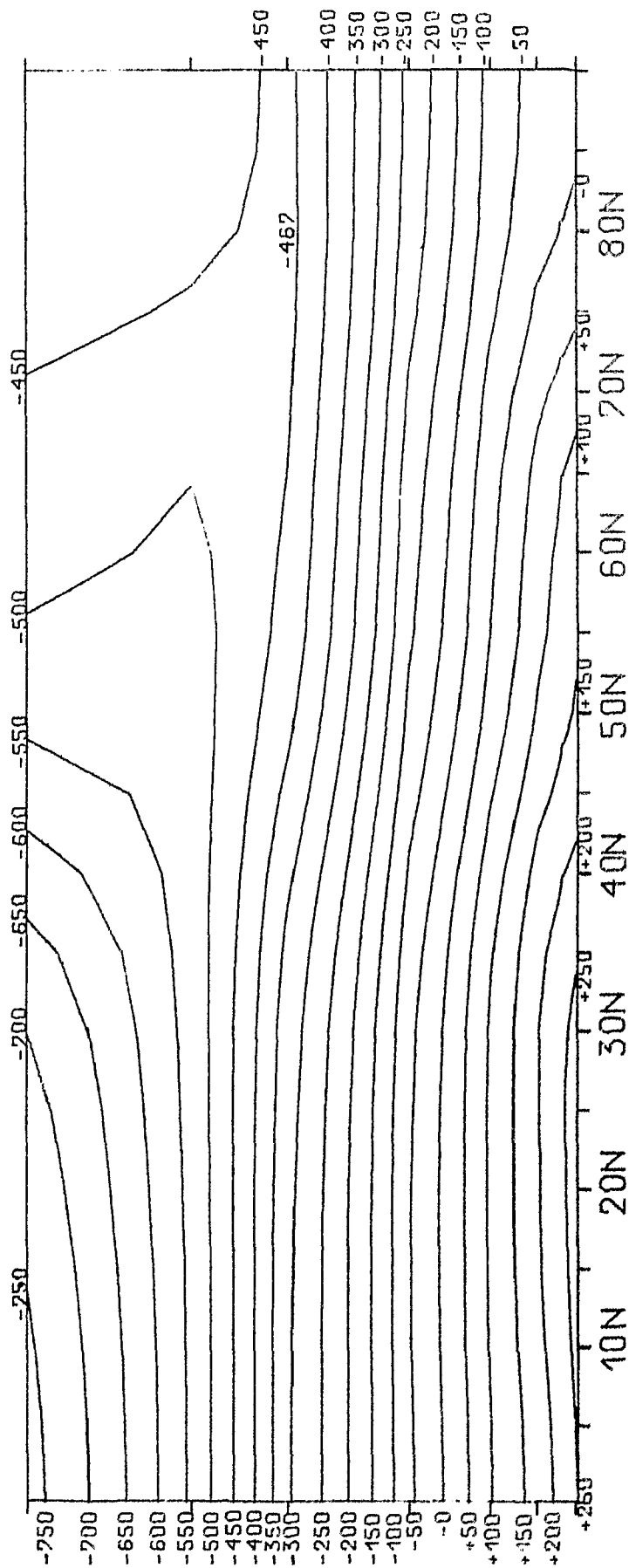
$[T]_{(\lambda)}$  IN 1/10 GRAD C JULY 74

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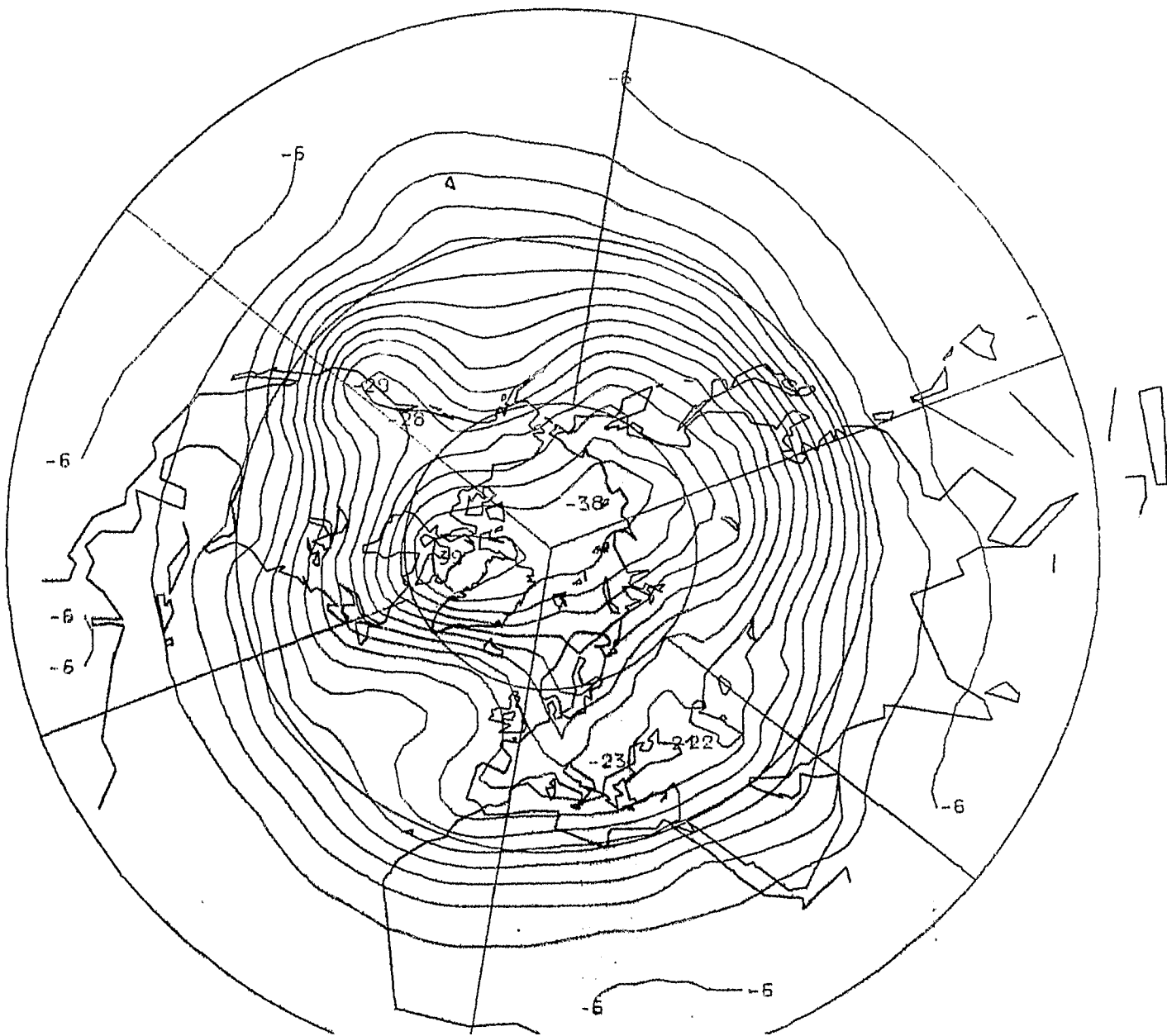


$[T]_{(\lambda)}$  IN 1/10 GRAD C JULY 75

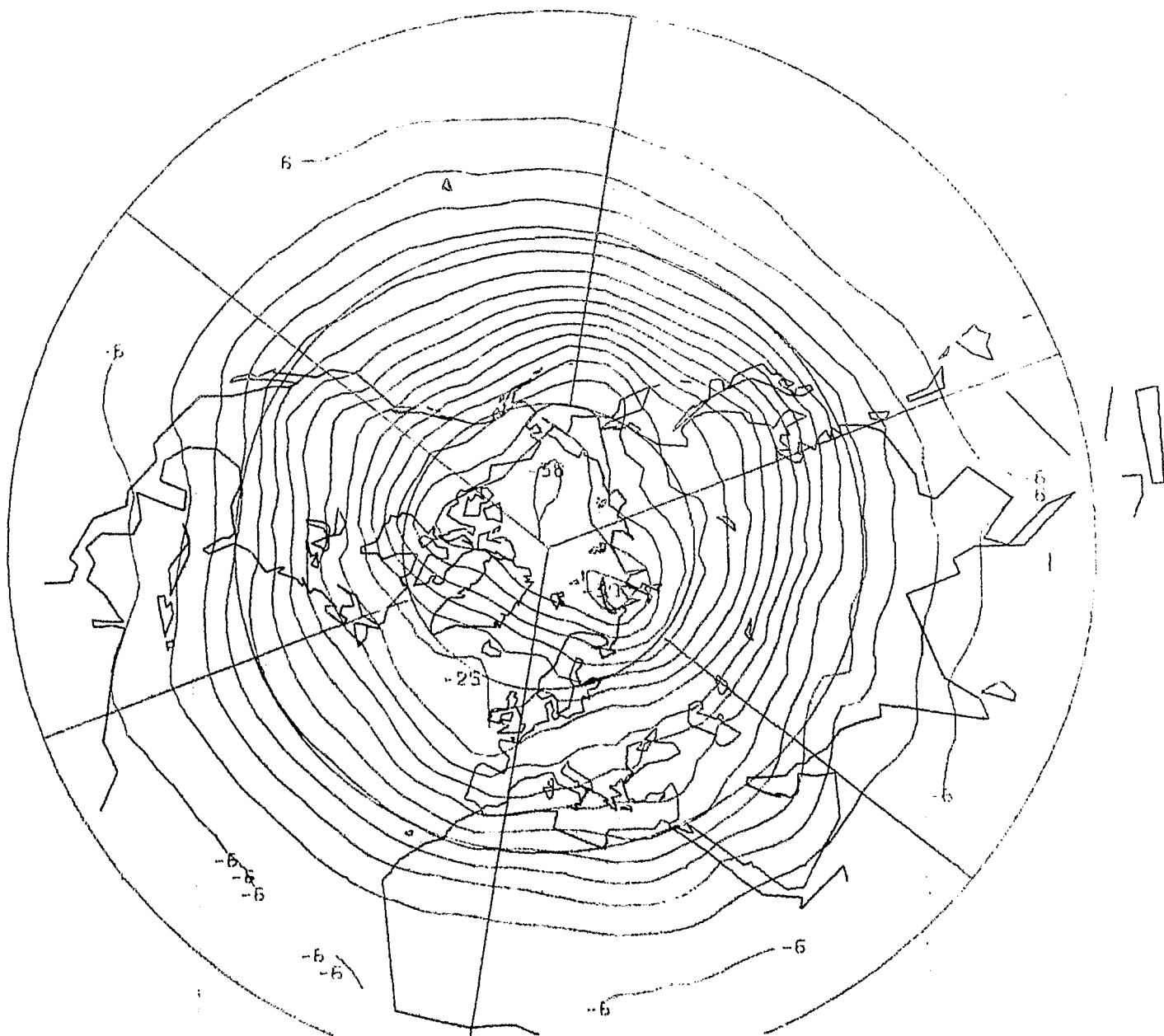
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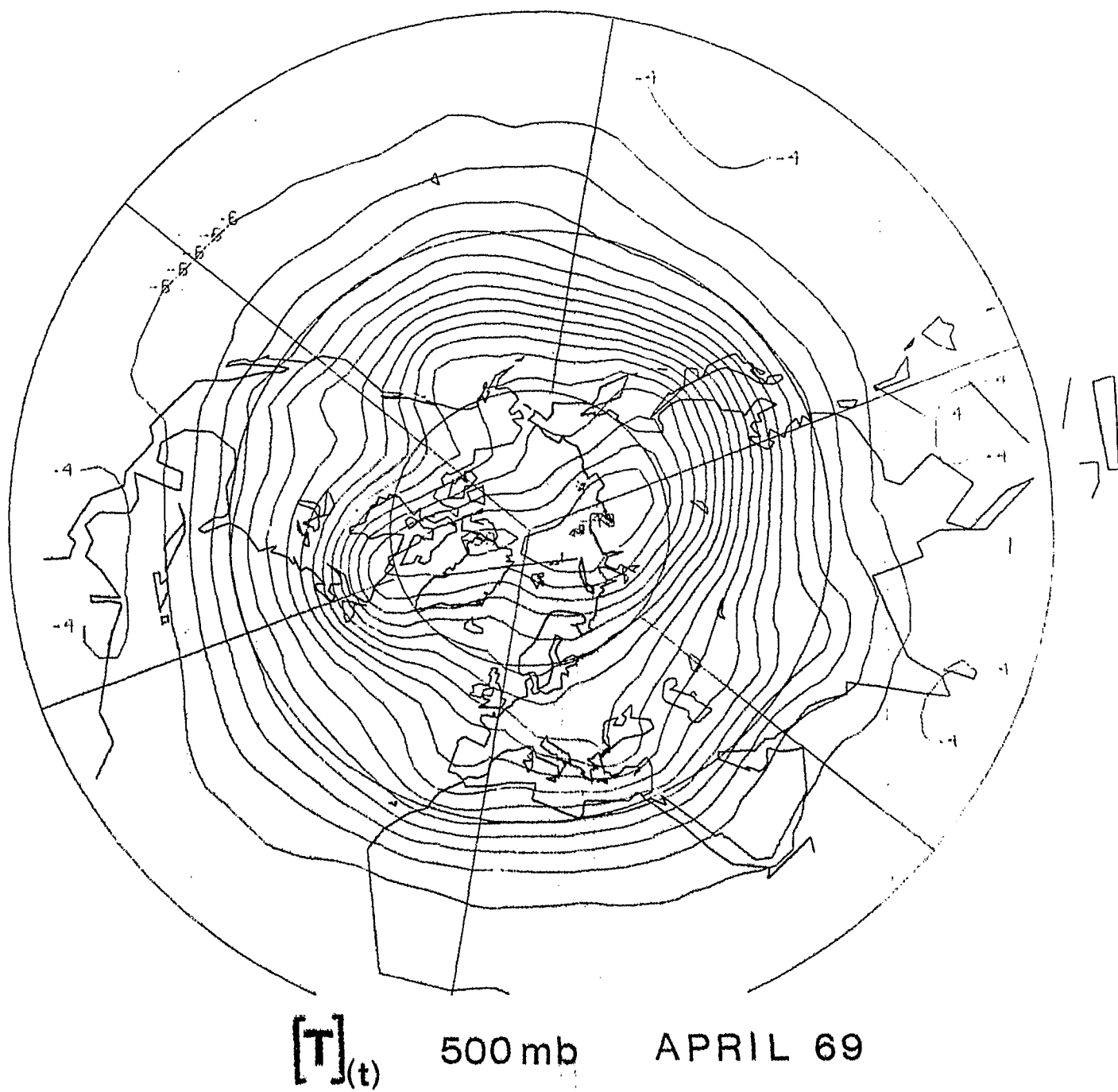
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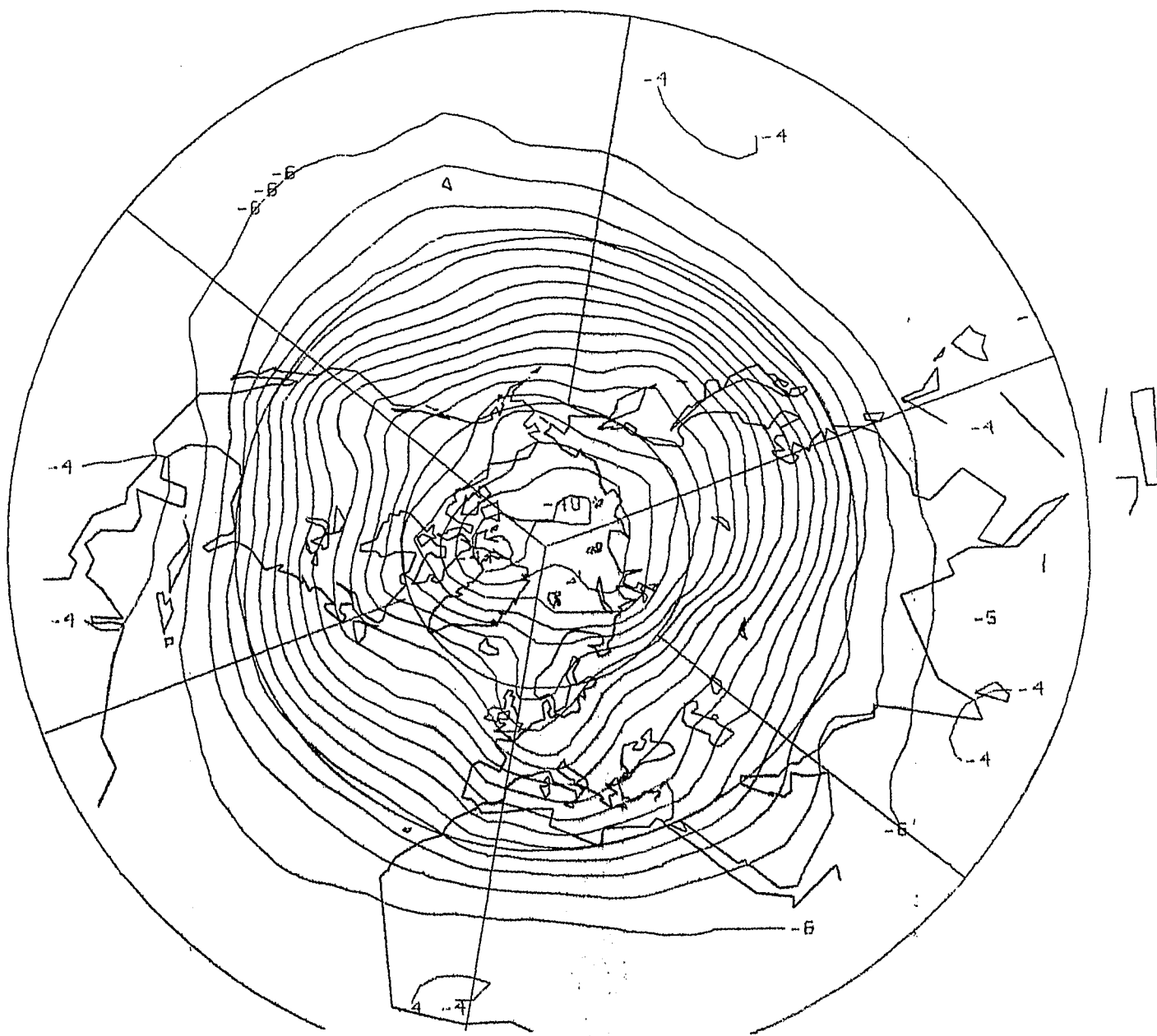
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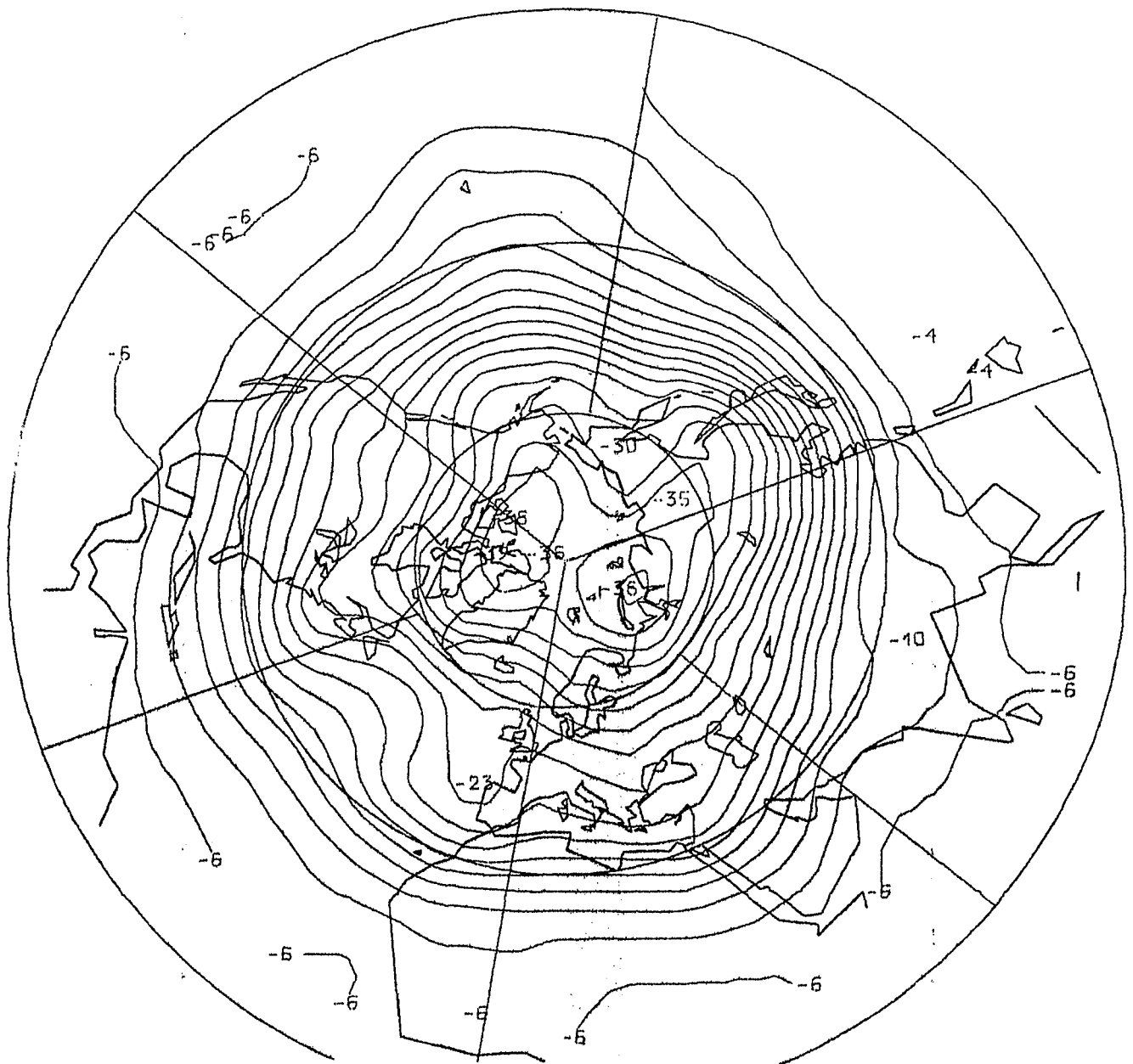
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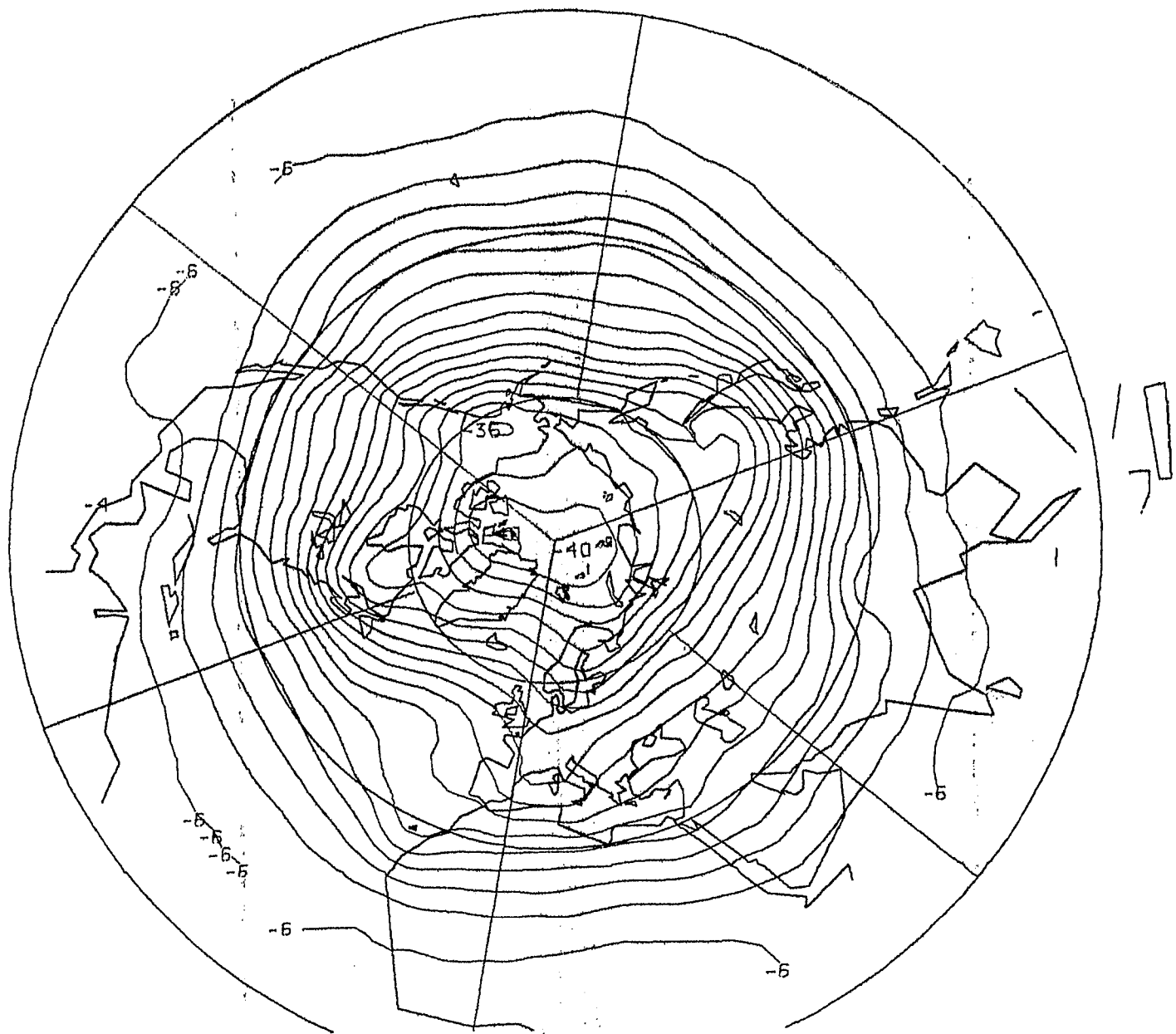




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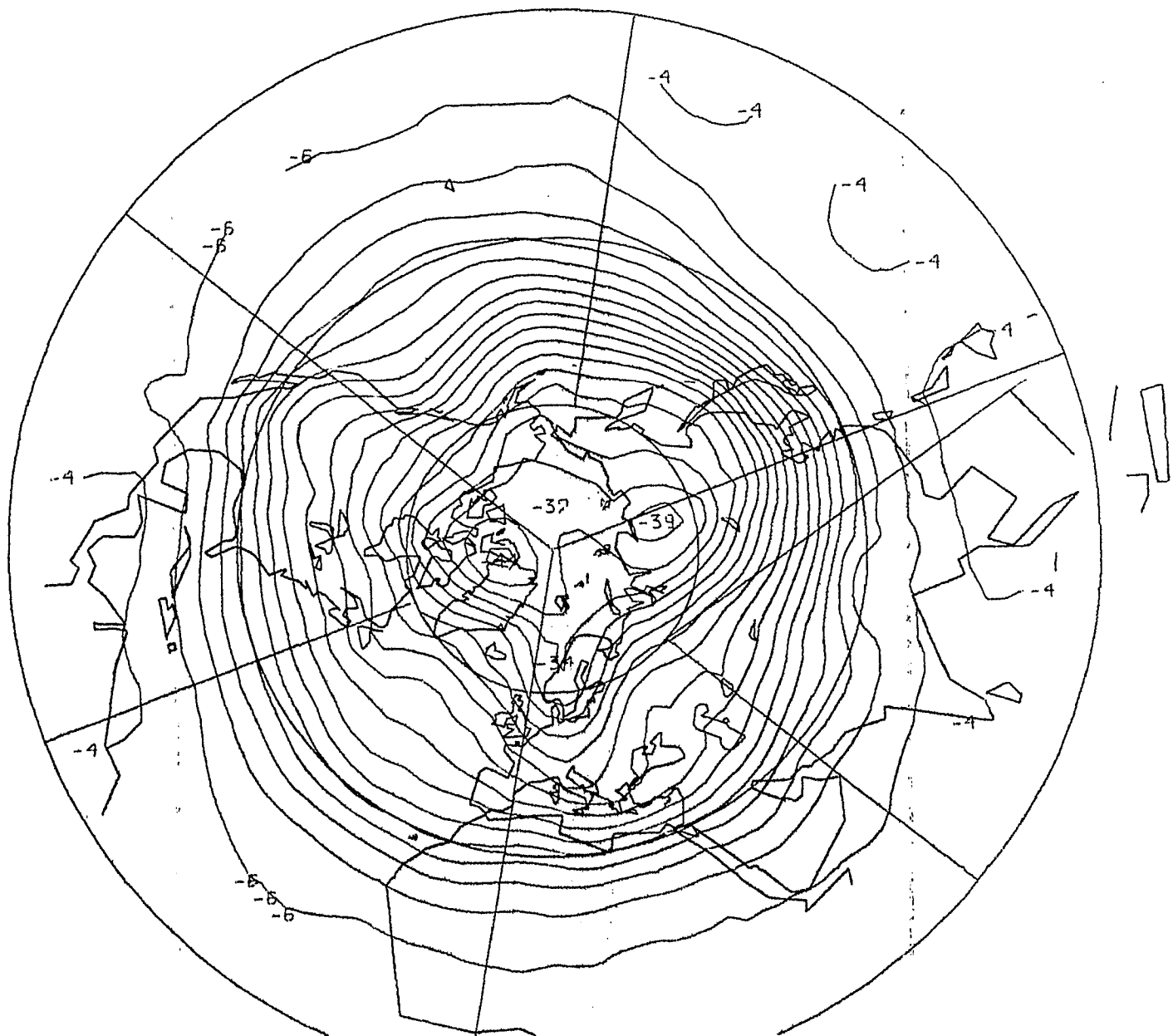
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$[T]_{(t)}$

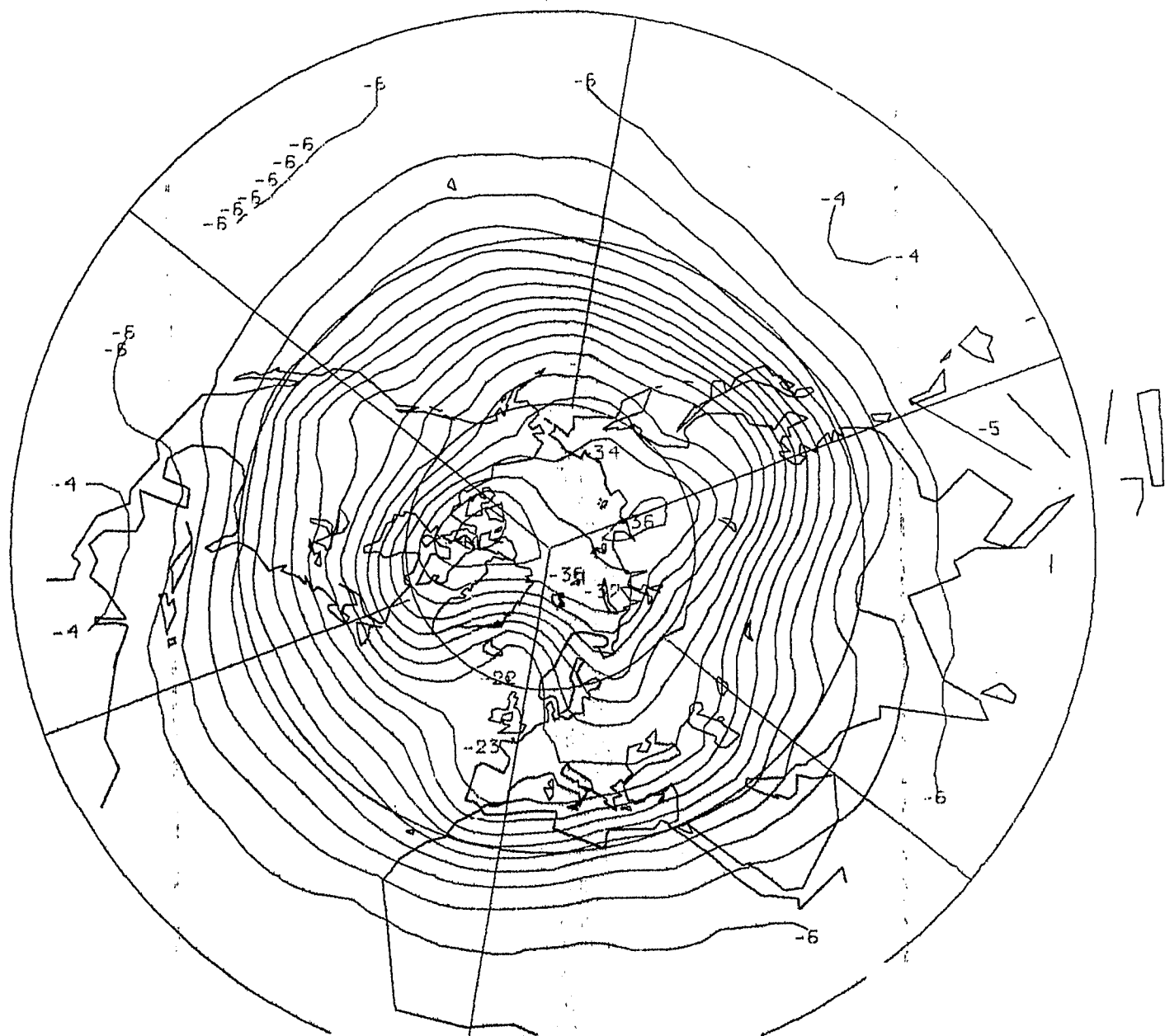
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APRIL 72

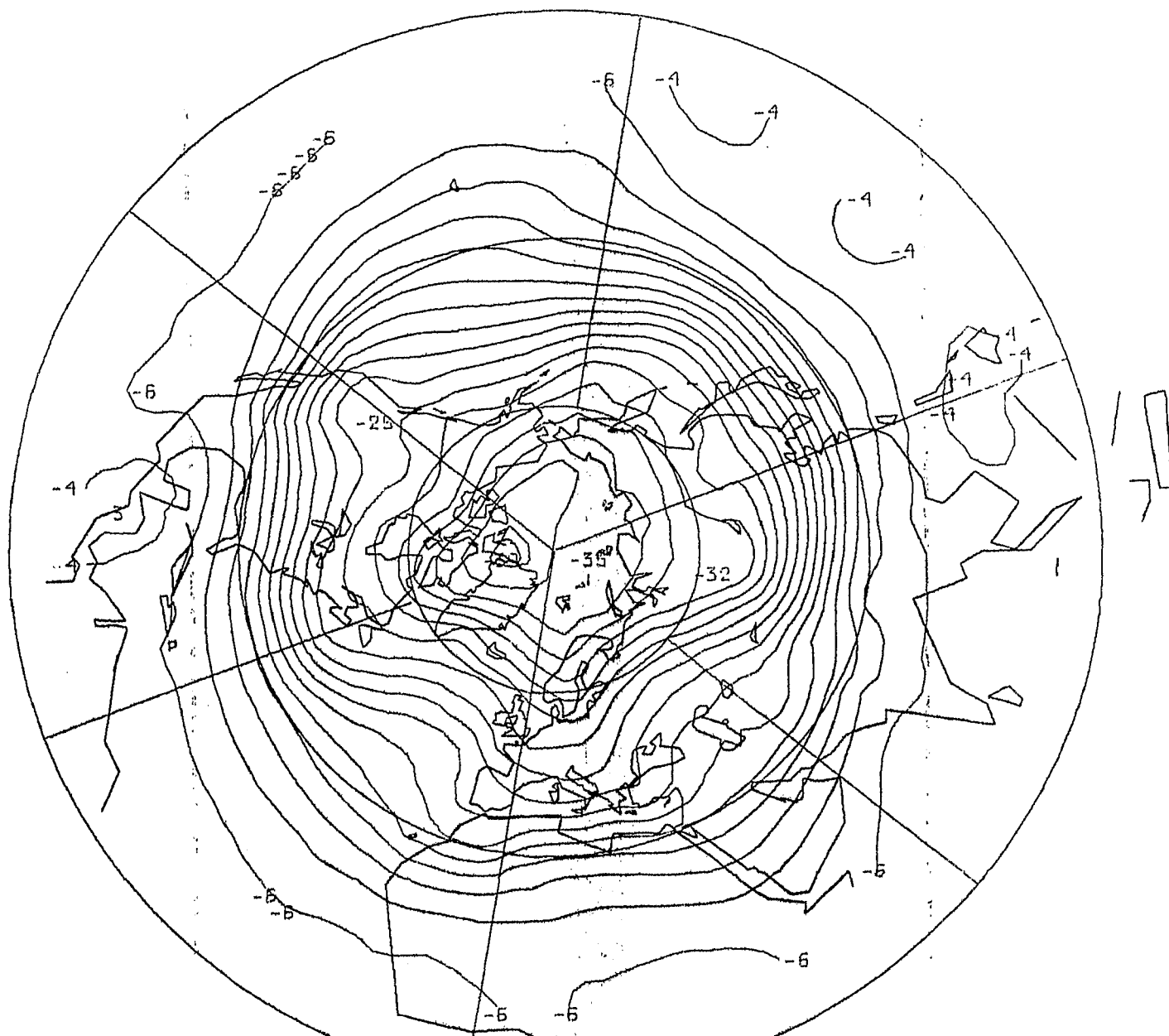


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Abb.39



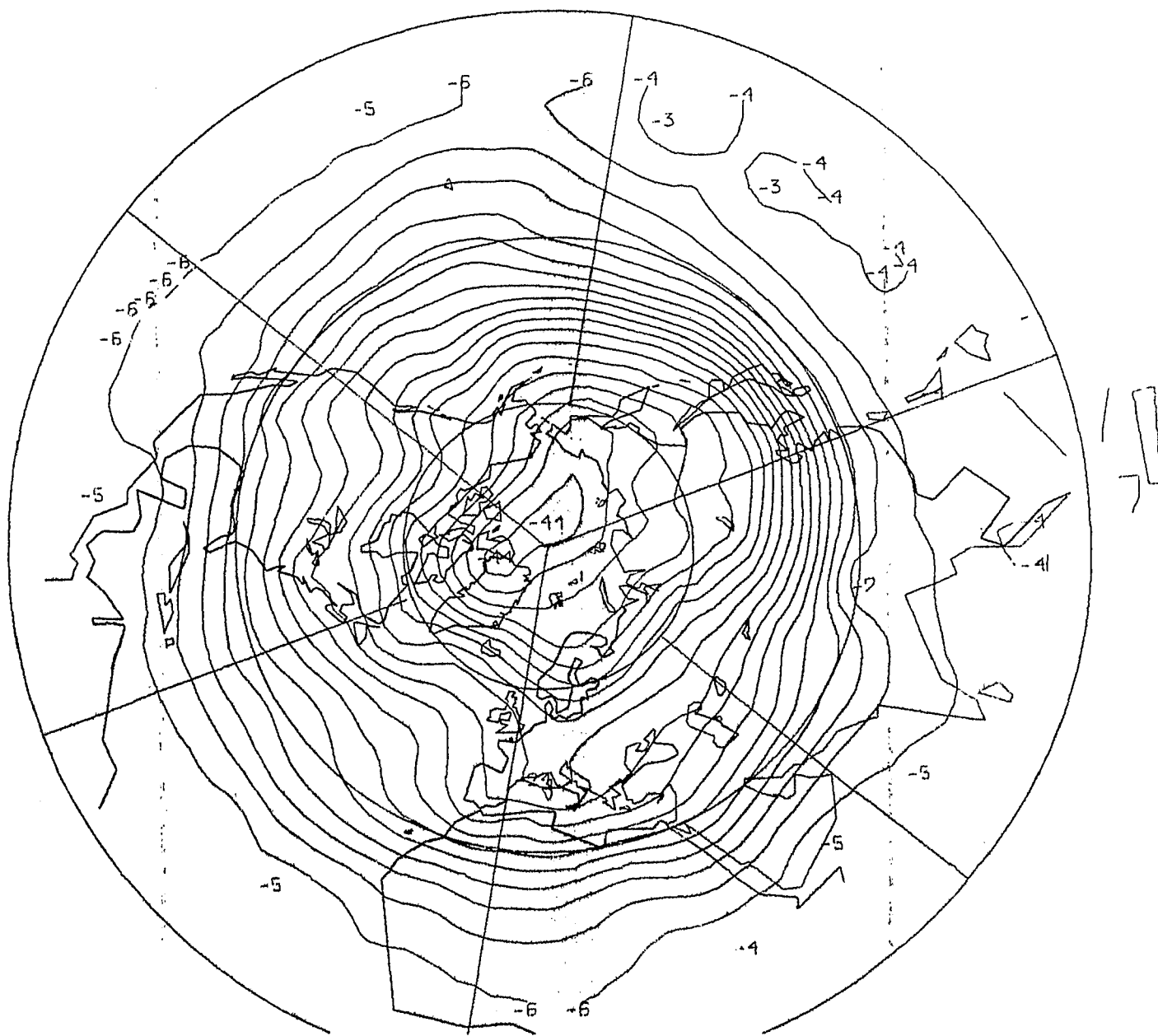
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$[T]_{(t)}$

500 mb

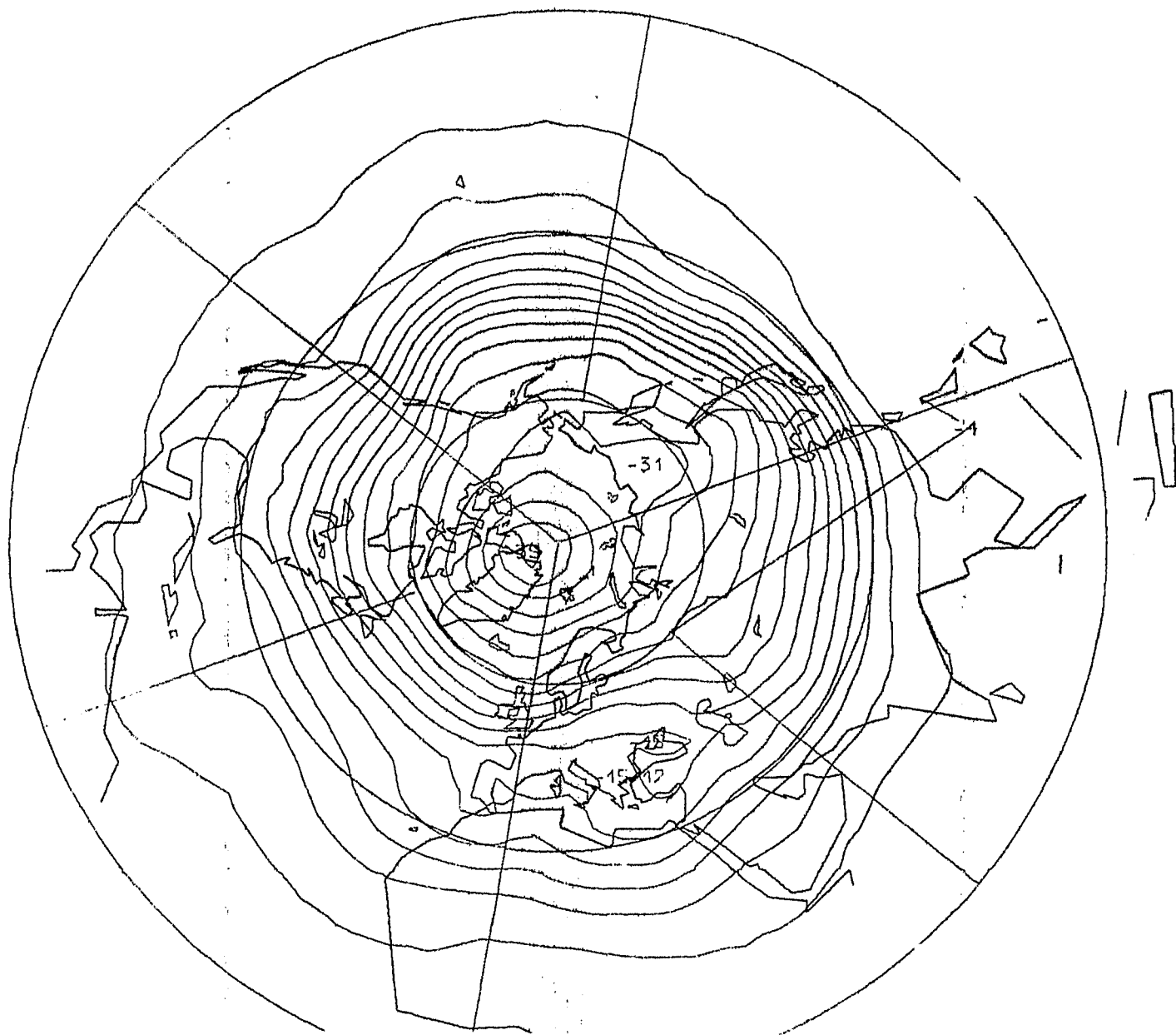
APRIL 75



$[\pi]_{(t)}$

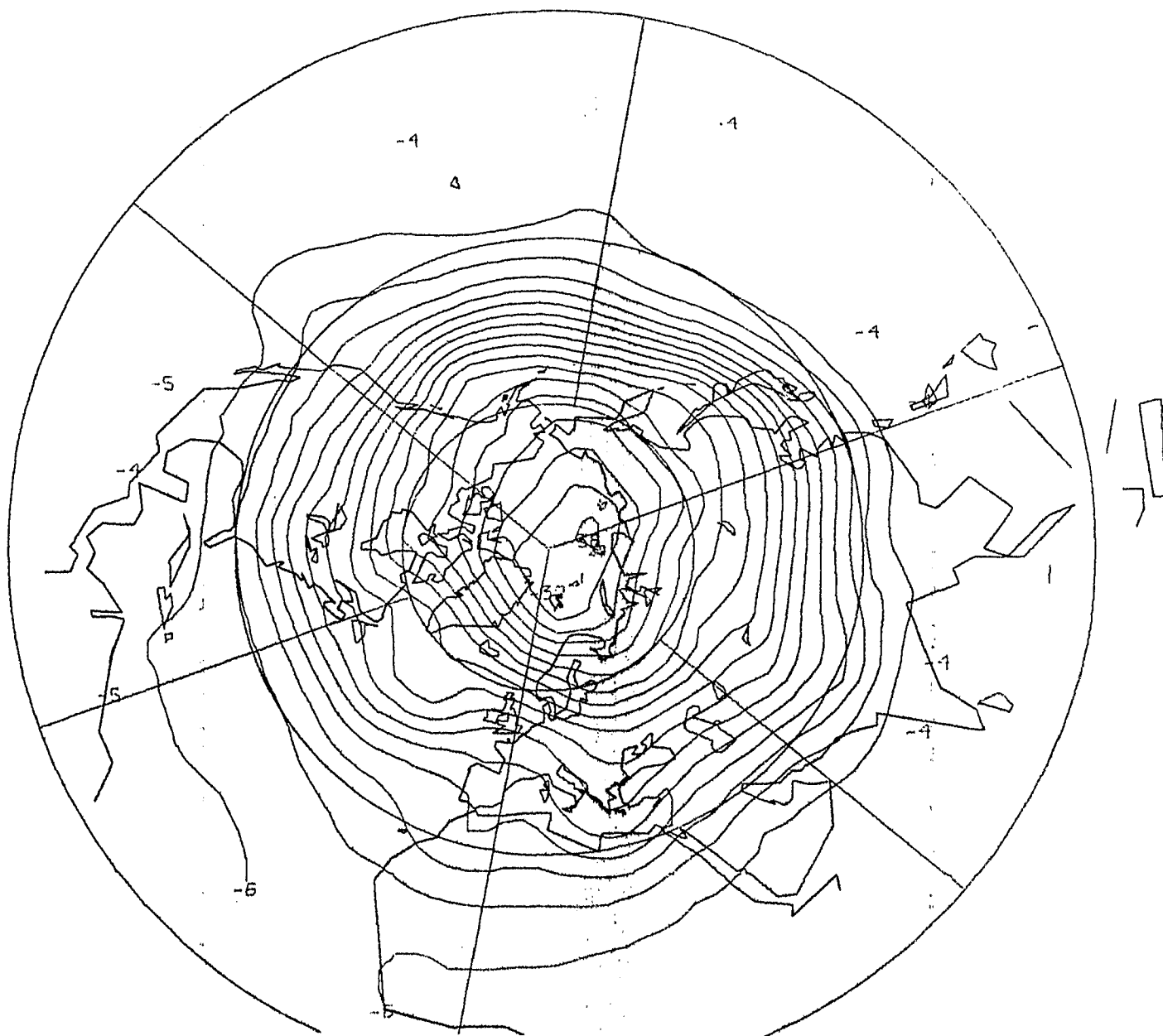
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APRIL 76

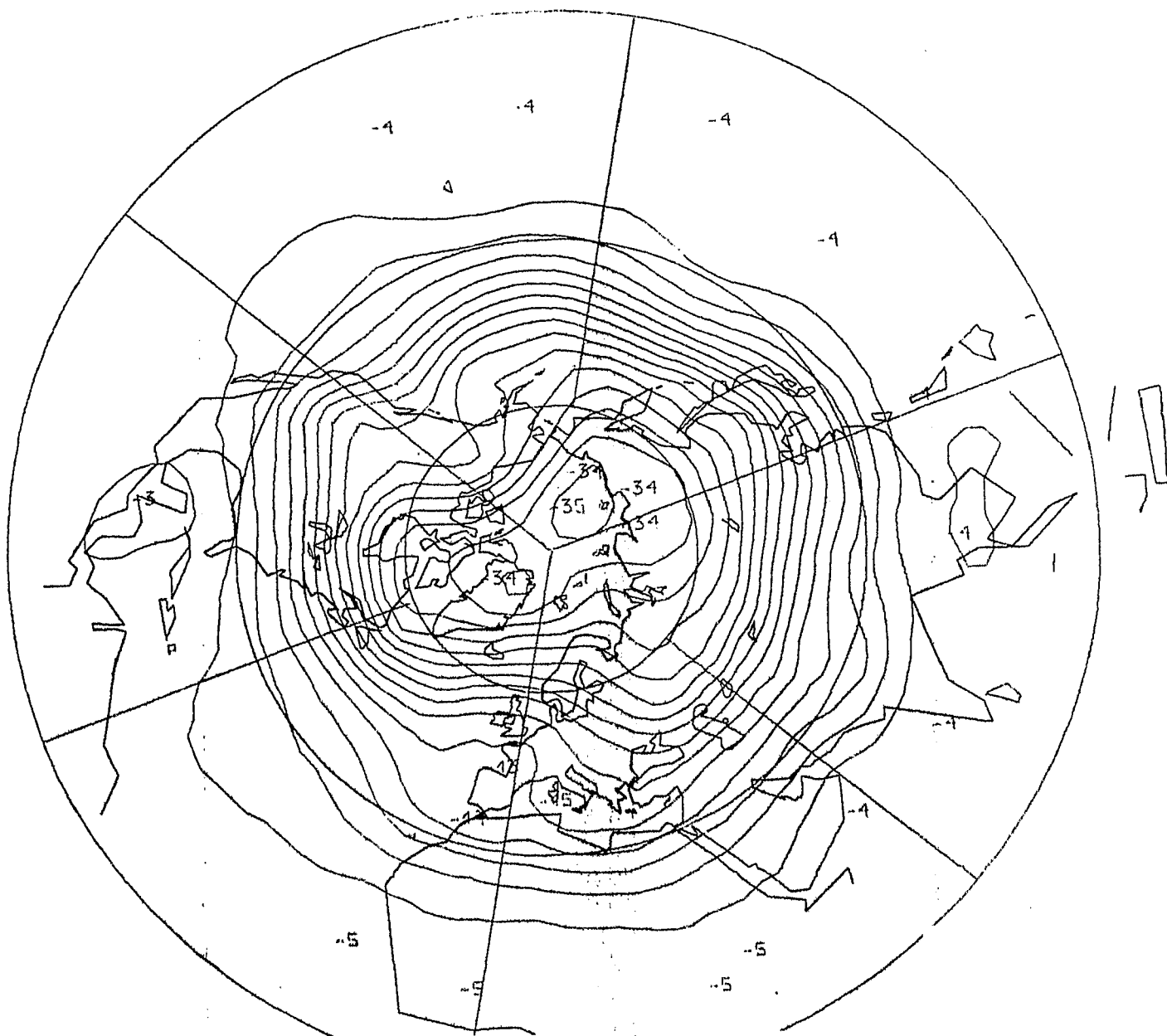


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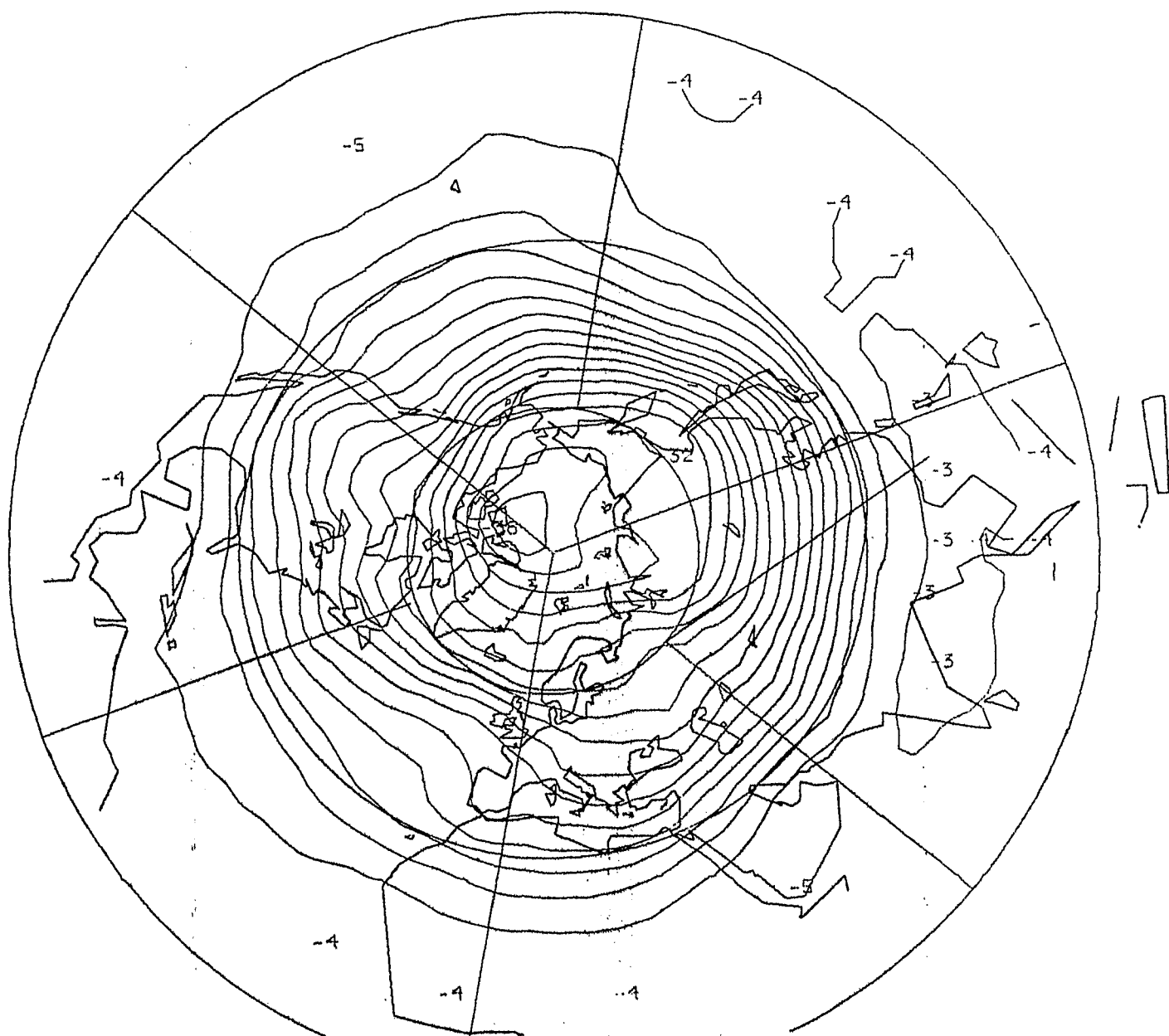




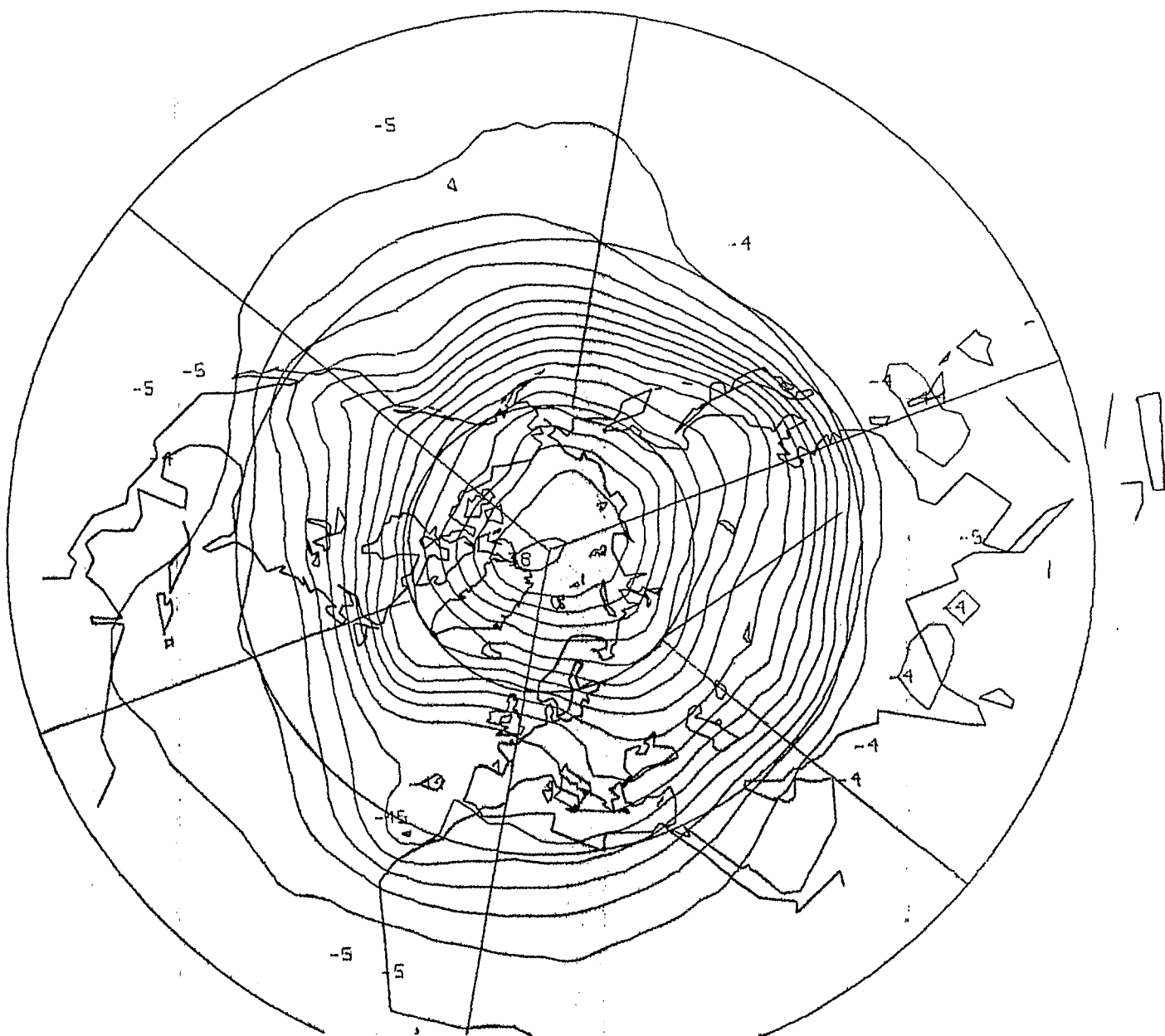
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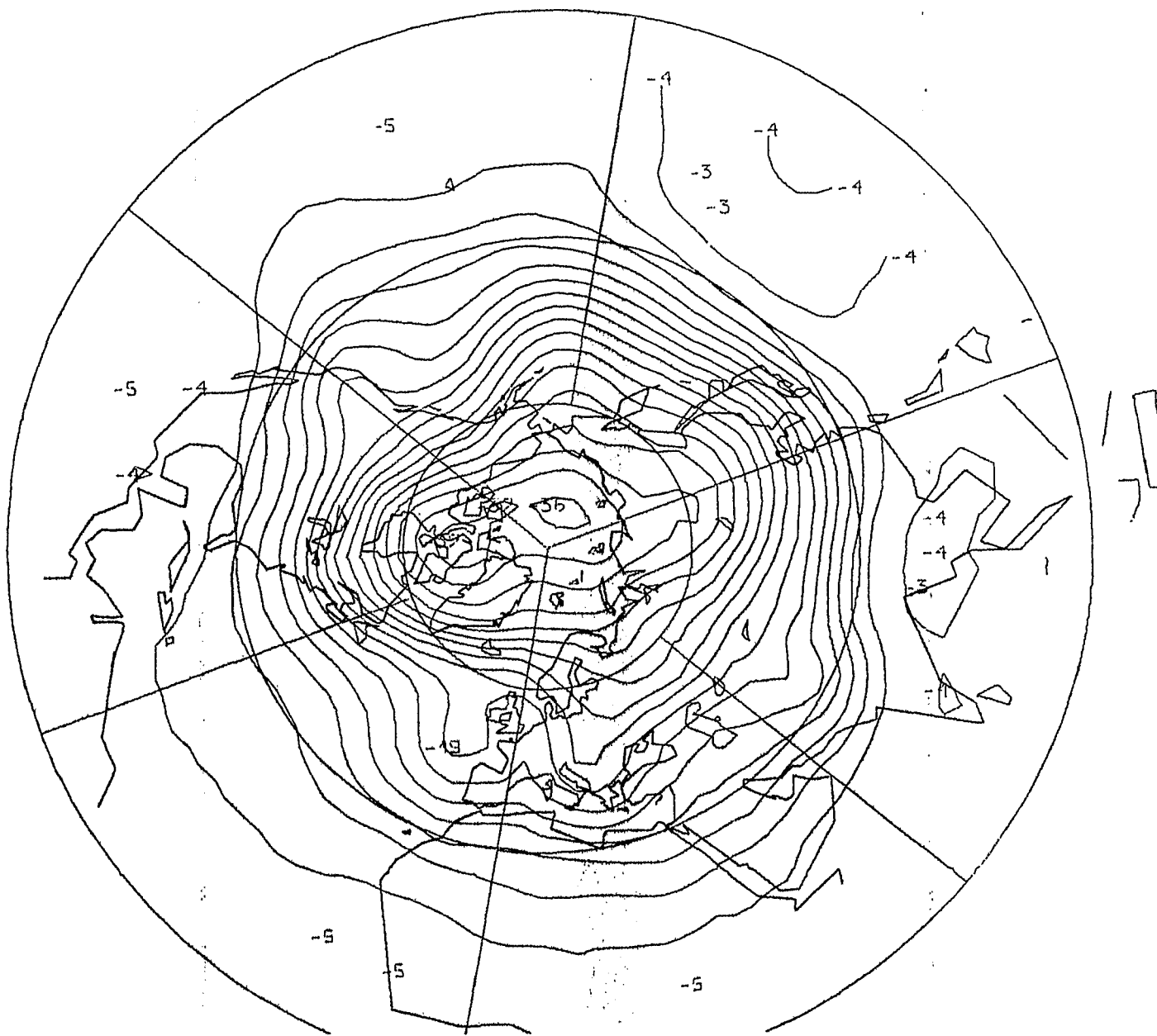
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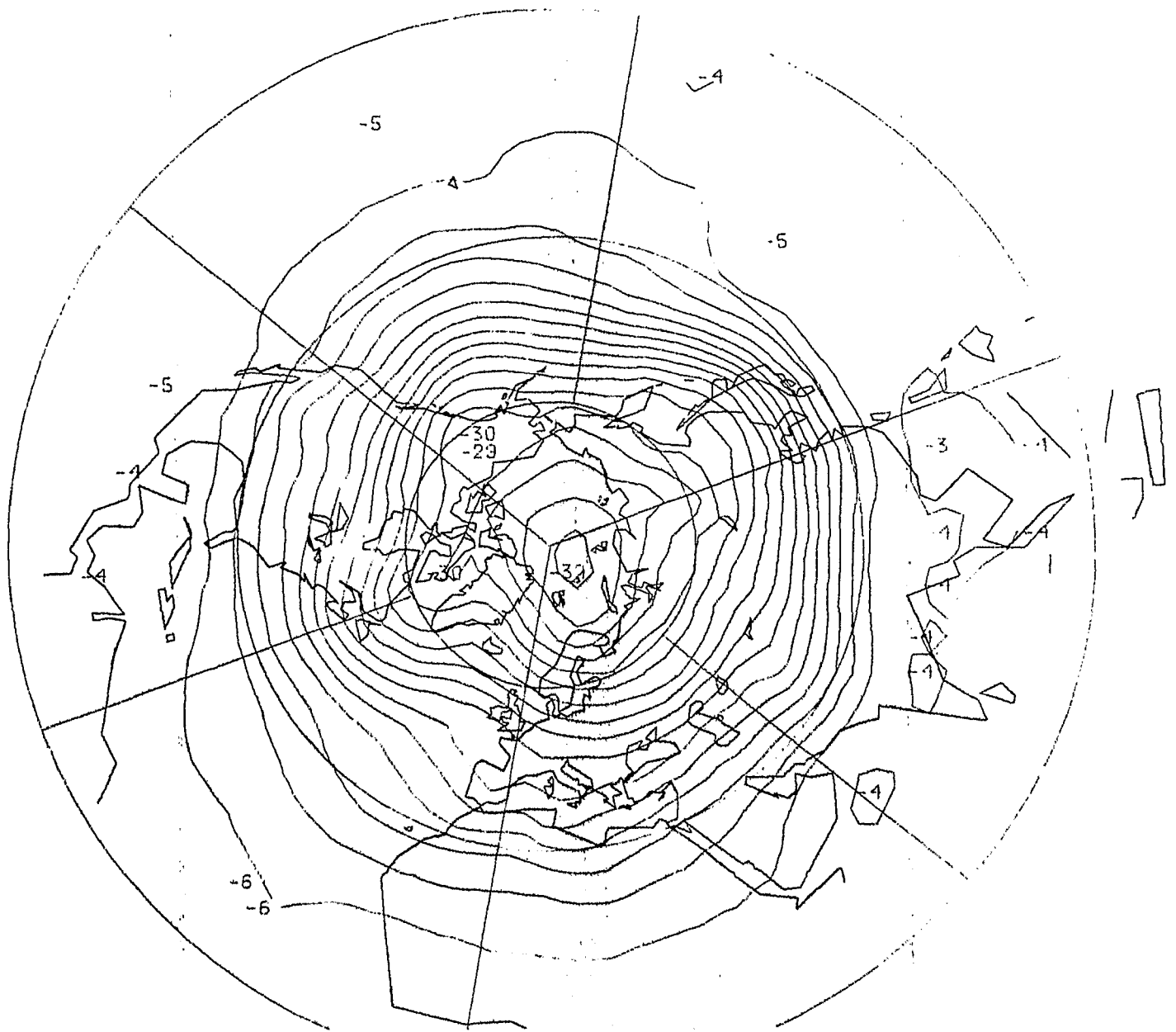
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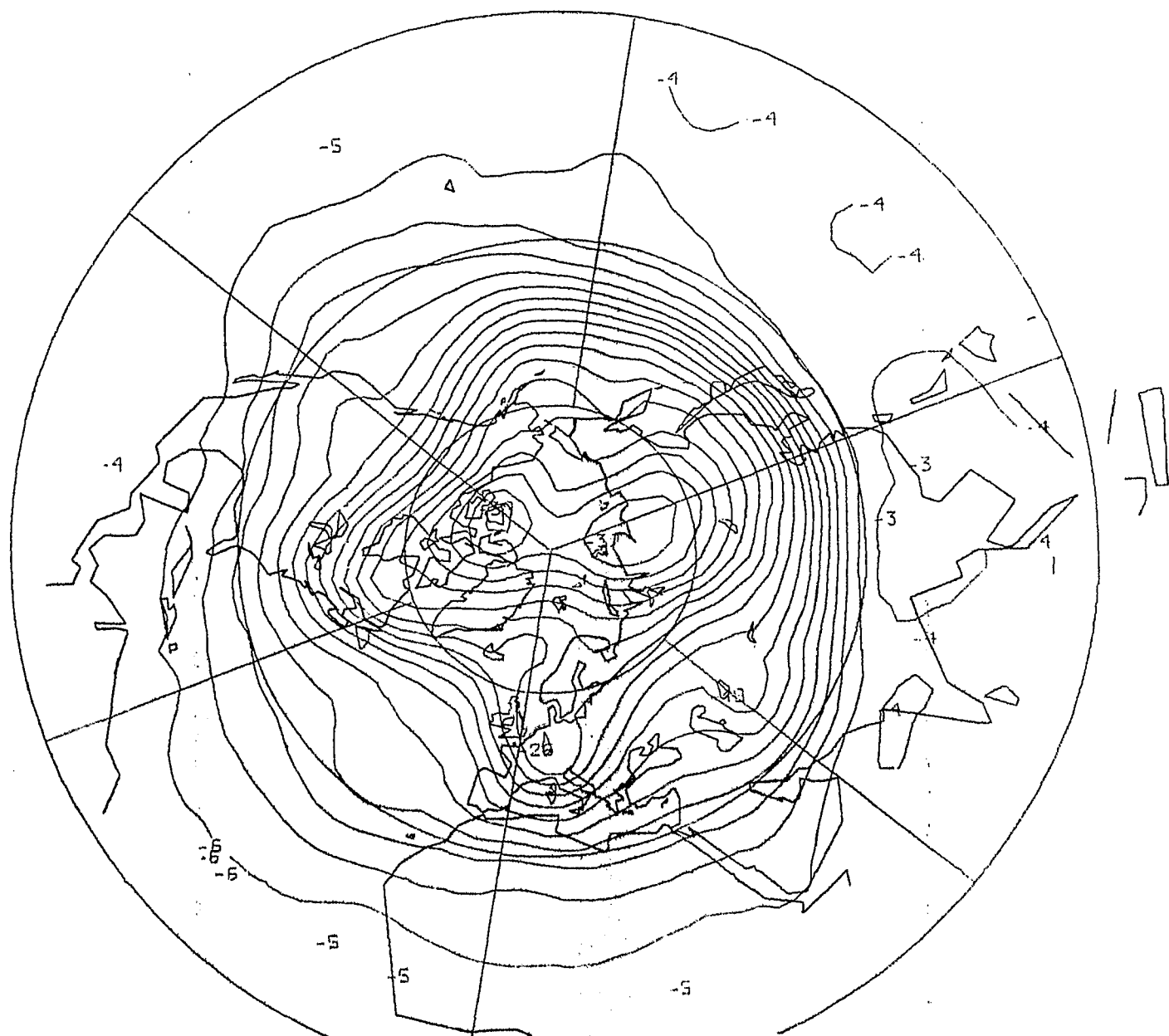
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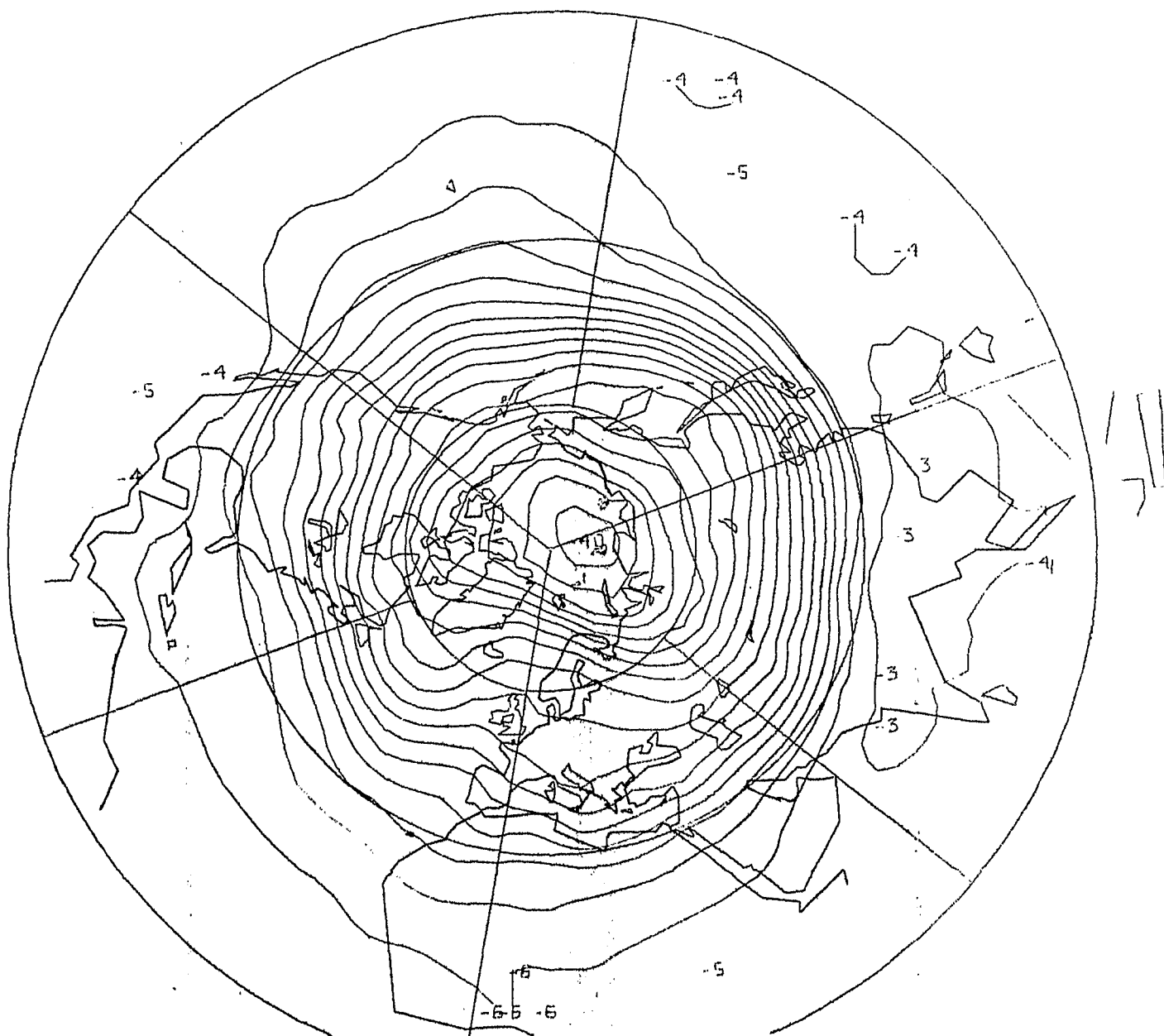
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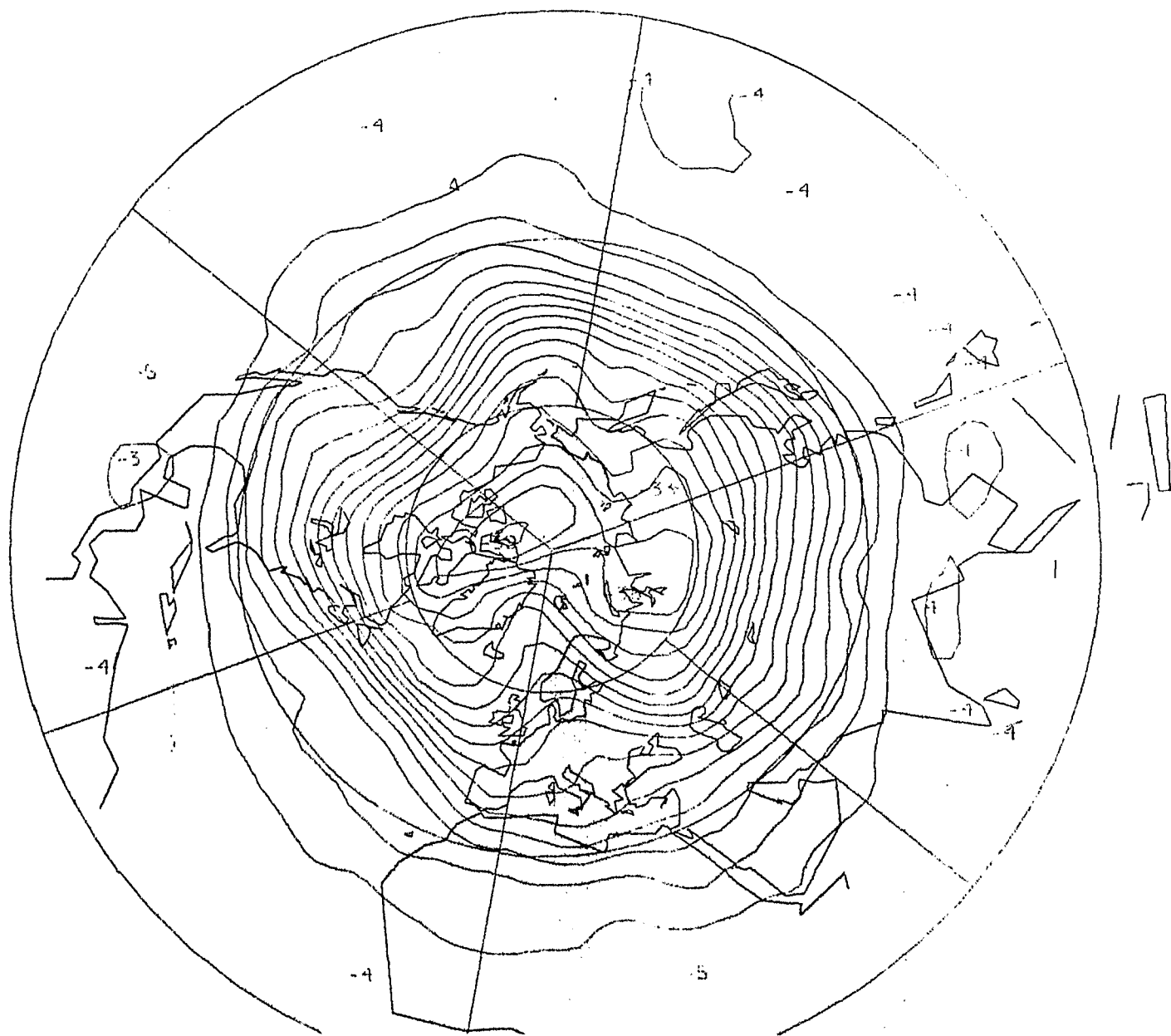


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$[T]_{(t)}$  500 mb OKT. 75





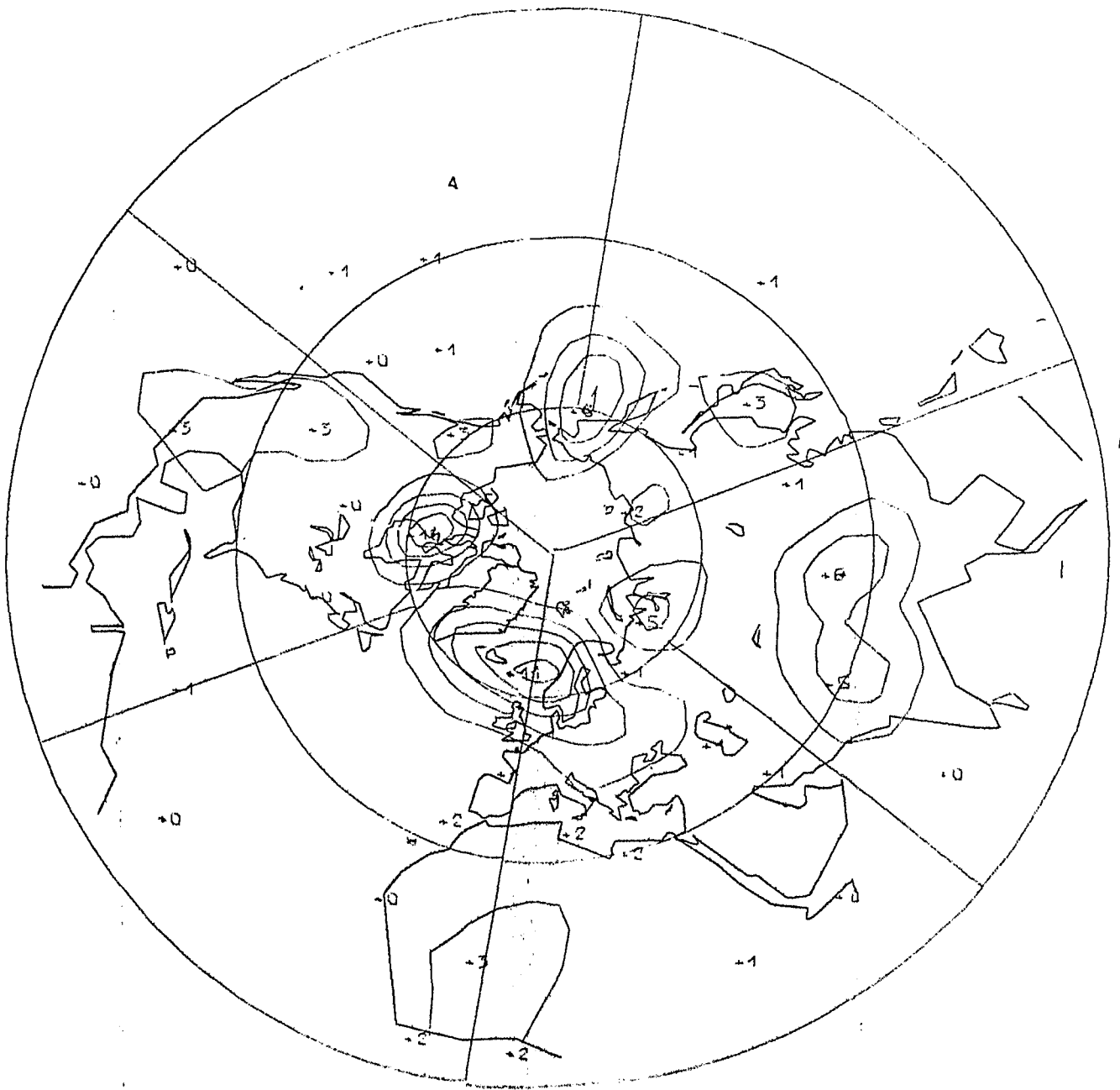
$[T]_{(t)}$  500 mb OKT. 76



**A<sub>MSE</sub>**    APRIL    1967

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb. 53



**A<sub>MSE</sub>** APRIL 1968

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb. 54



**A<sub>MSE</sub>** APRIL 1969

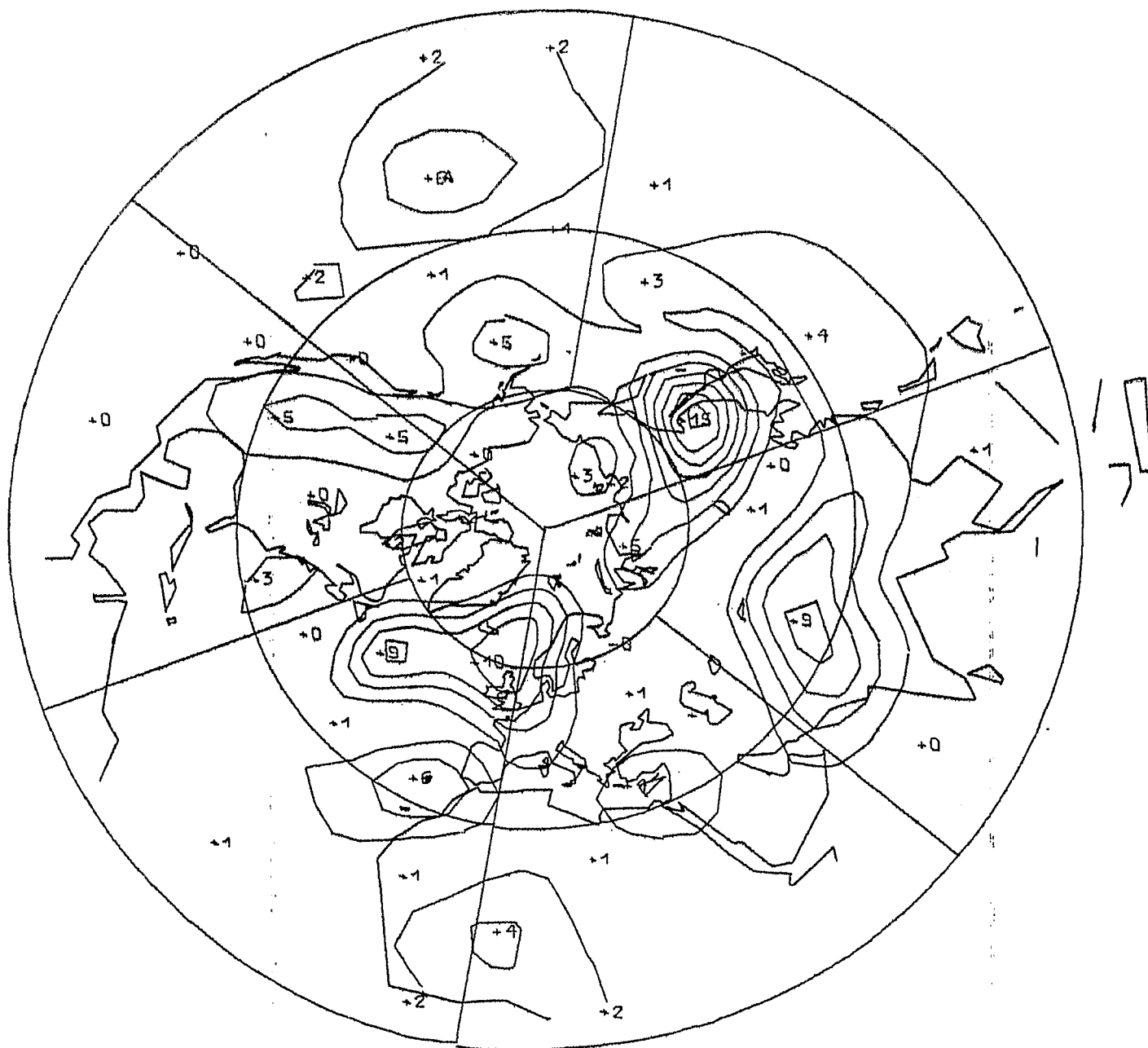
**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**



**A<sub>MSE</sub>** APRIL 1970

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.56



**A<sub>MSE</sub>** APRIL 1971

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**



**A<sub>MSE</sub>**      APRIL 1972

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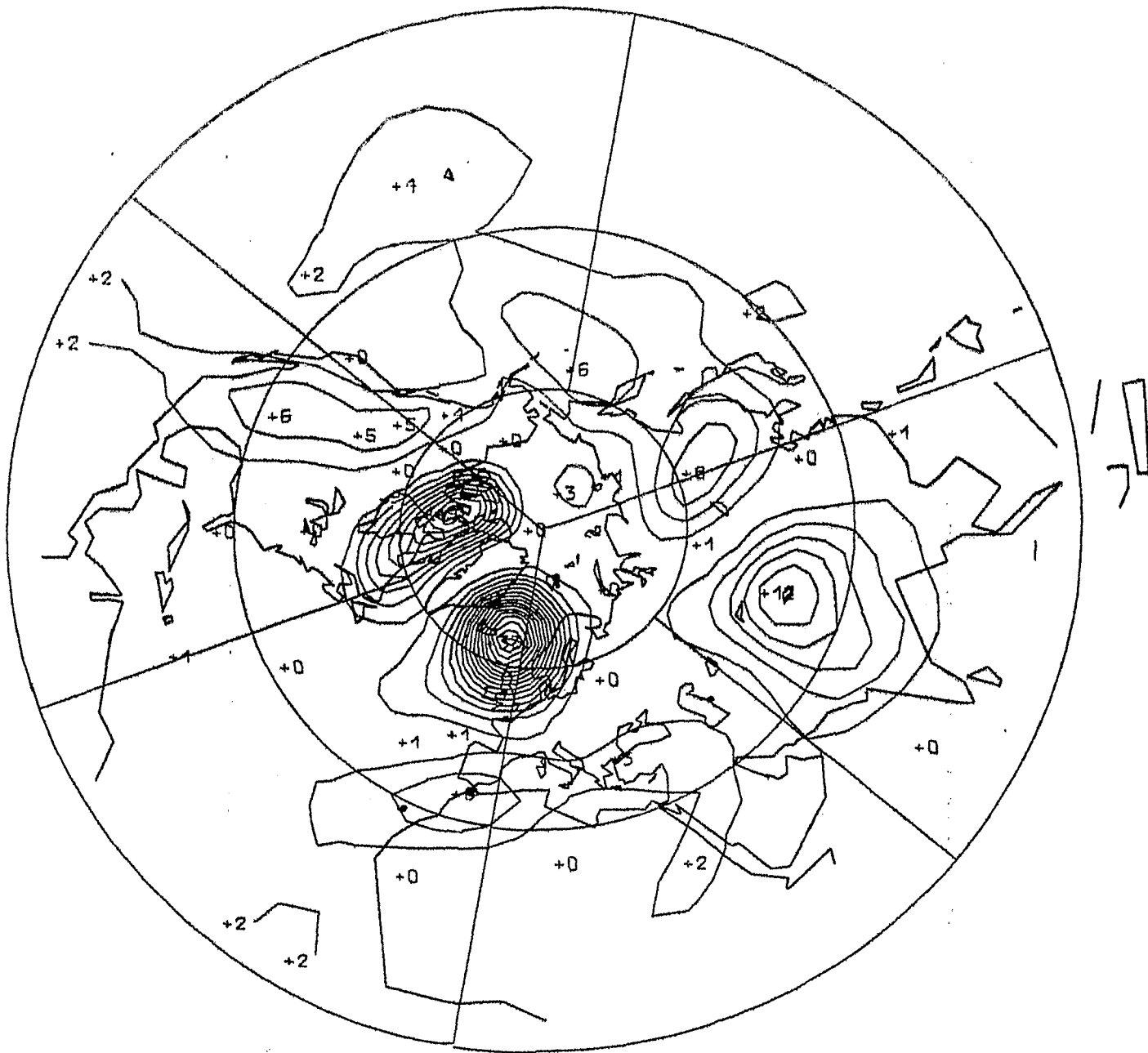
Abb.58



**$A_{MSE}$**       APRIL 1973

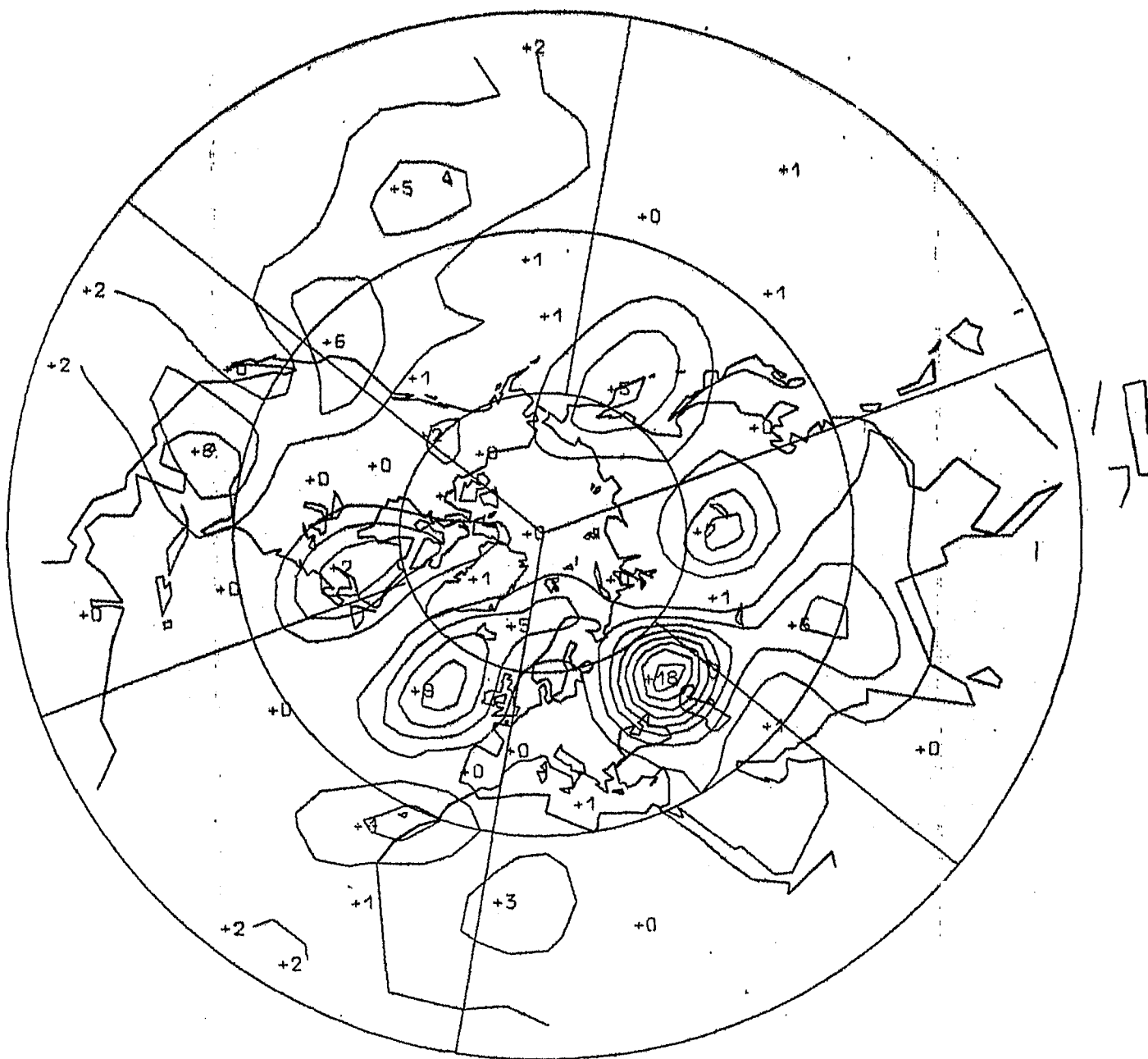
**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**





**A** **MSE** APRIL 1974

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**



**A<sub>MSE</sub>**      APRIL 1975

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**



**A<sub>MSE</sub>**

**APRIL 1976**

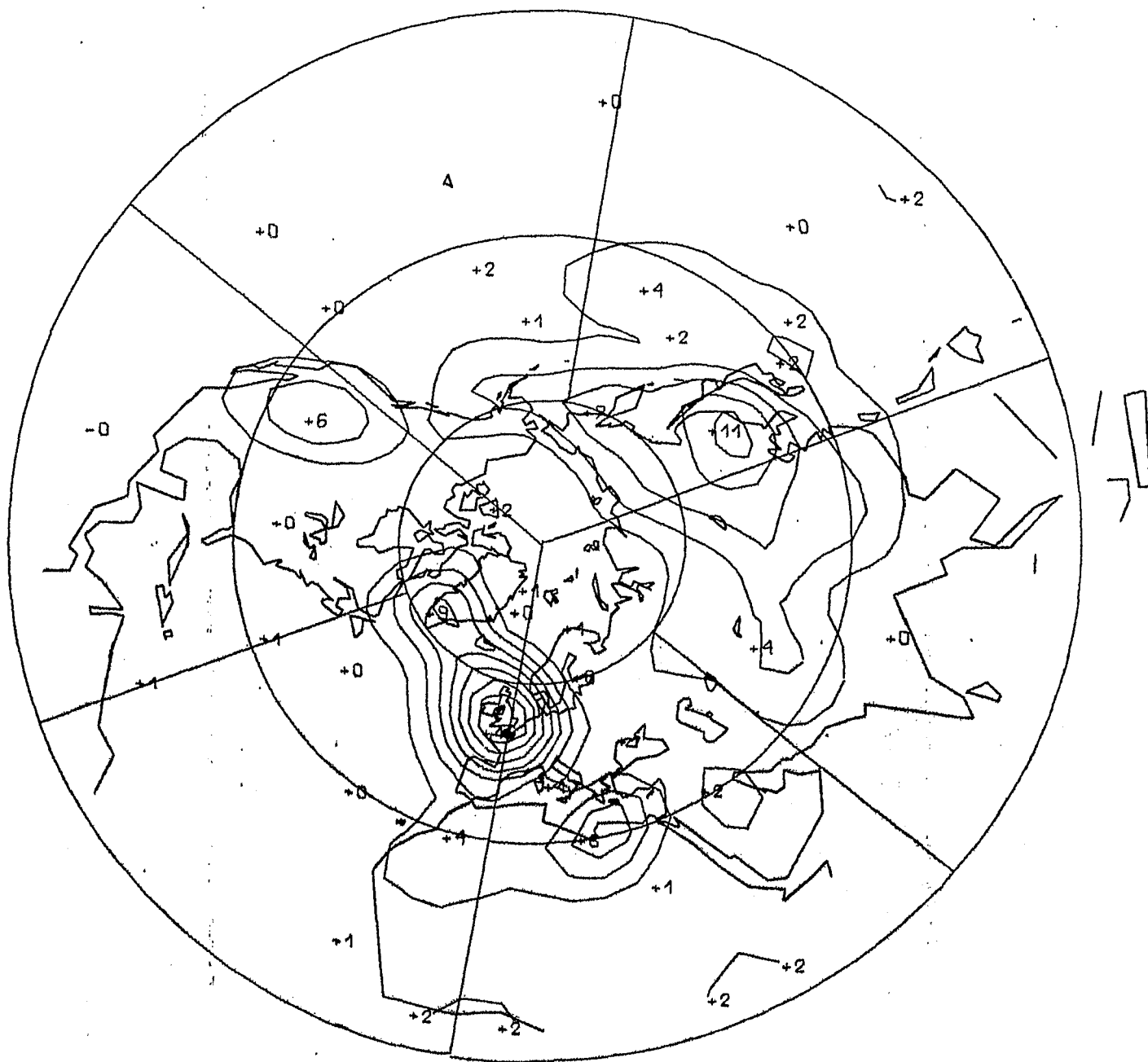
**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**



**A<sub>MSE</sub>** OKT. 1967

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.63



**A<sub>MSE</sub>** OKT. 1968

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb. 64



**A**  
**MSE**

 $10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$ 

Abb 65



**A<sub>MSE</sub> OKT. 1970**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb.66**



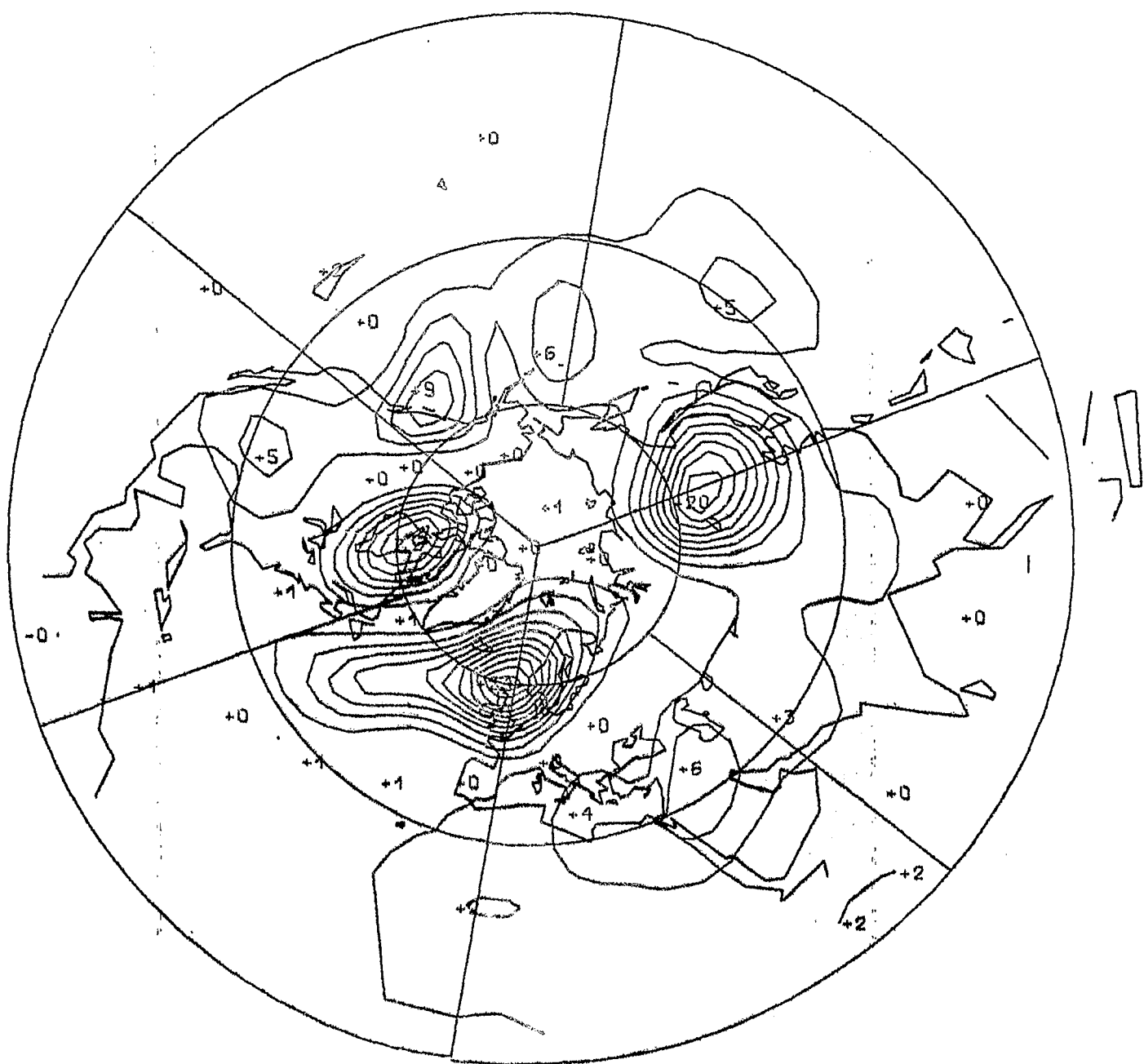
**A<sub>MSE</sub>**

**OKT. 1971**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb.67**

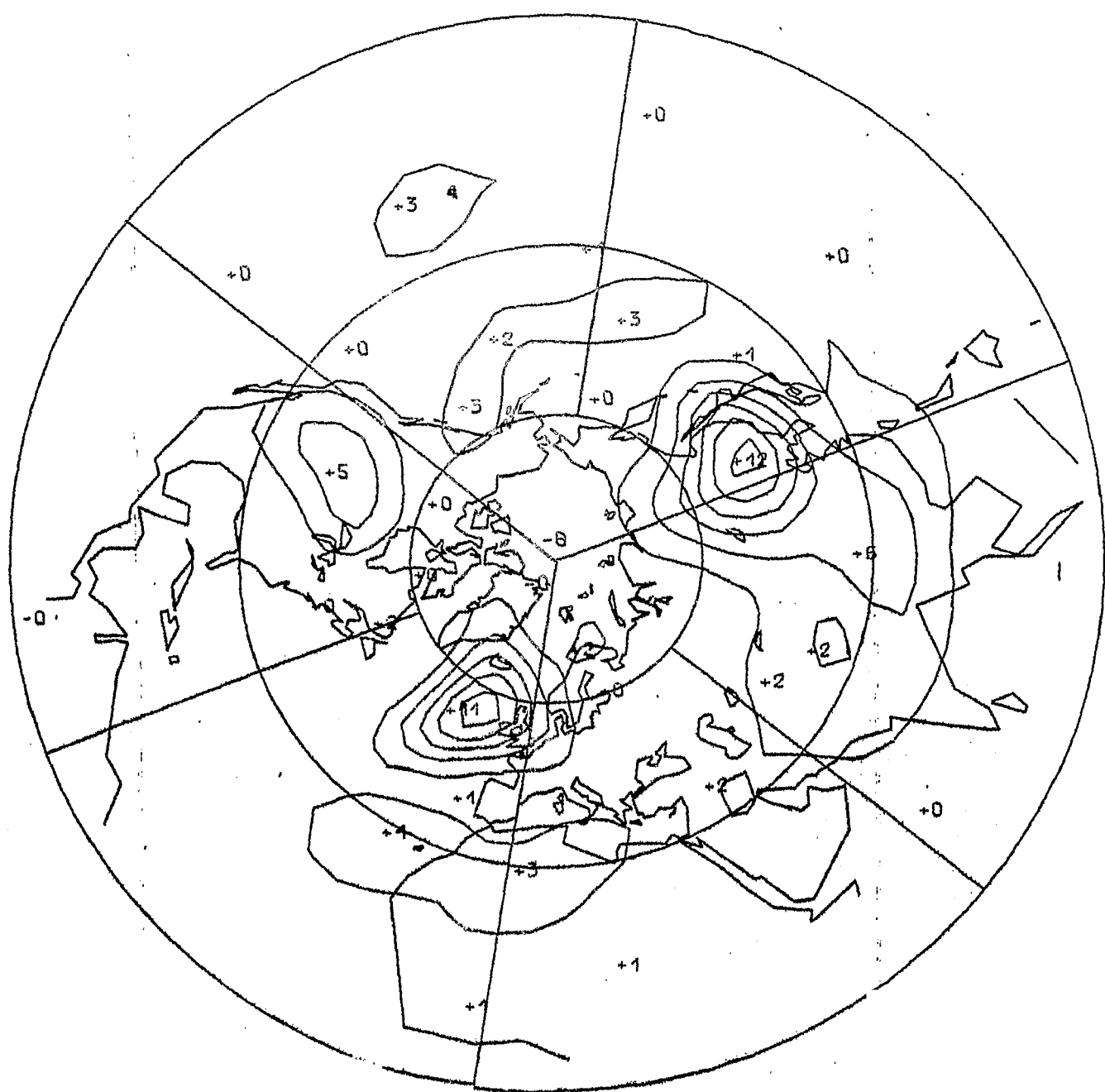




**A<sub>MSE</sub>** OKT. 1972

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.68



**A<sub>MSE</sub>**

**OKT. 1973**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb. 69**



**A<sub>MSE</sub> OKT. 1974**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb. 70



**A<sub>MSE</sub>** OKT. 1975

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

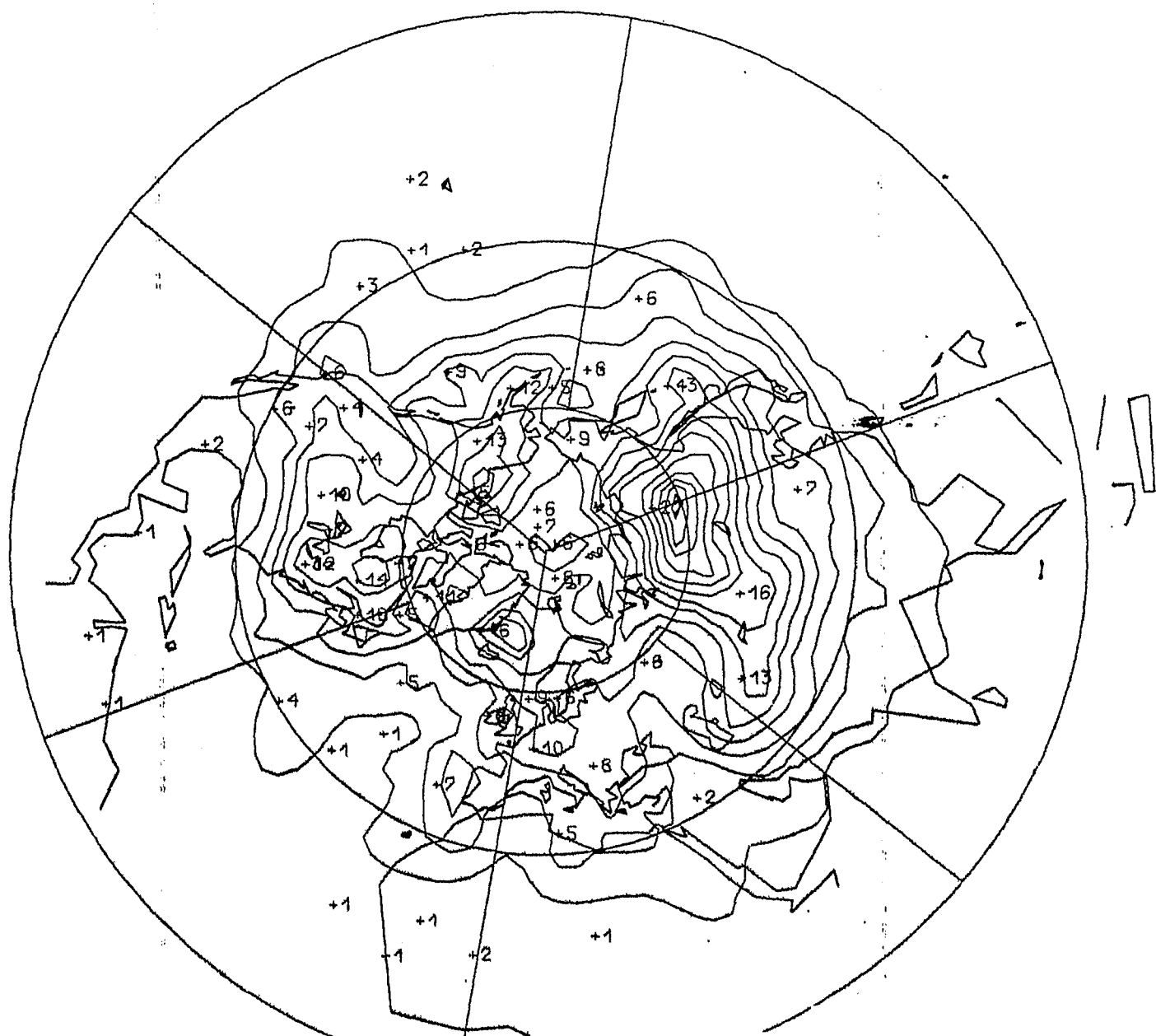
Abb.71



**A<sub>MSE</sub>** OKT. 1976

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.72



**A<sub>TE</sub> APRIL 1967**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

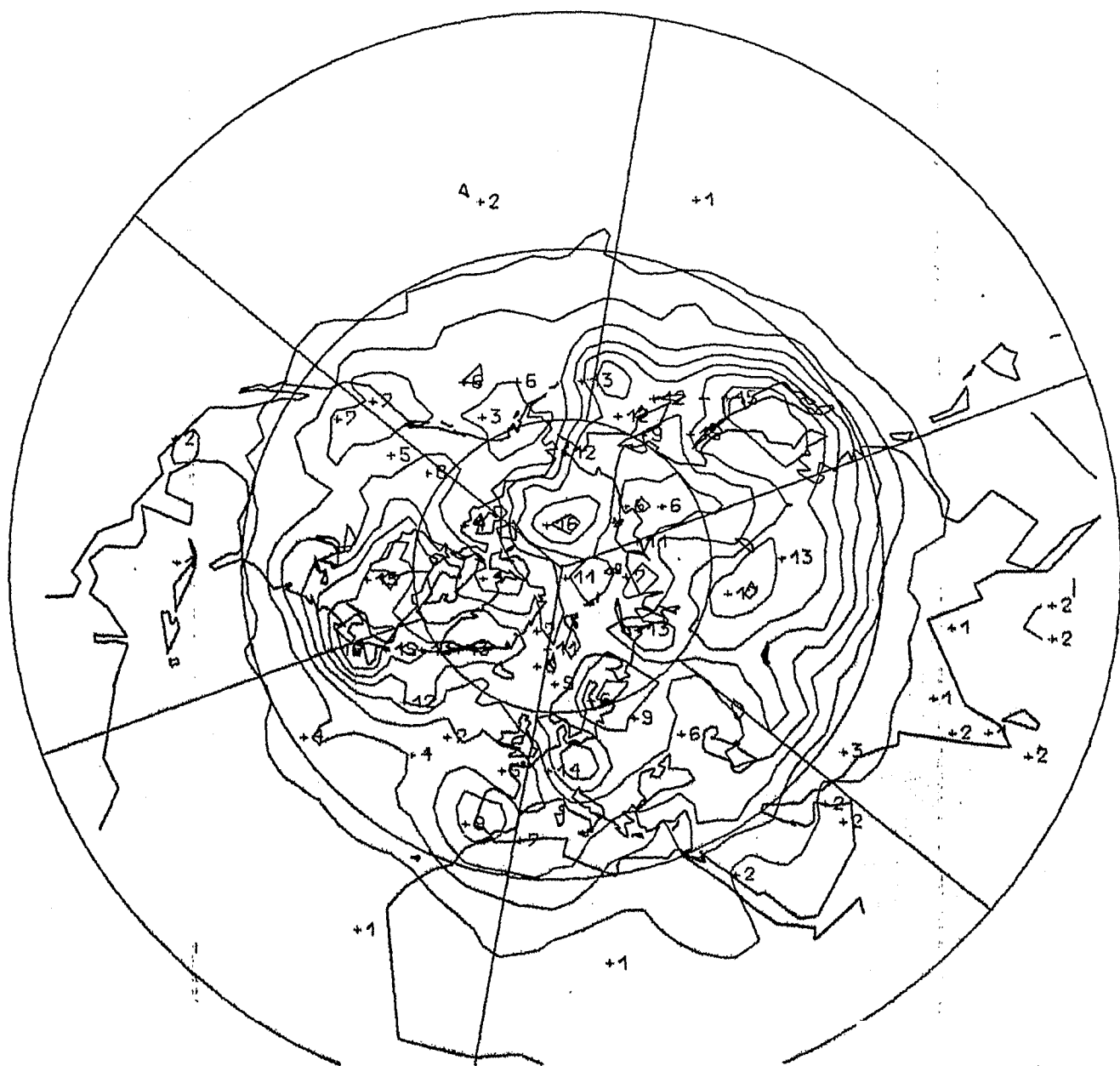
Abb.73



**A<sub>TE</sub>**    APRIL 1968

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.74



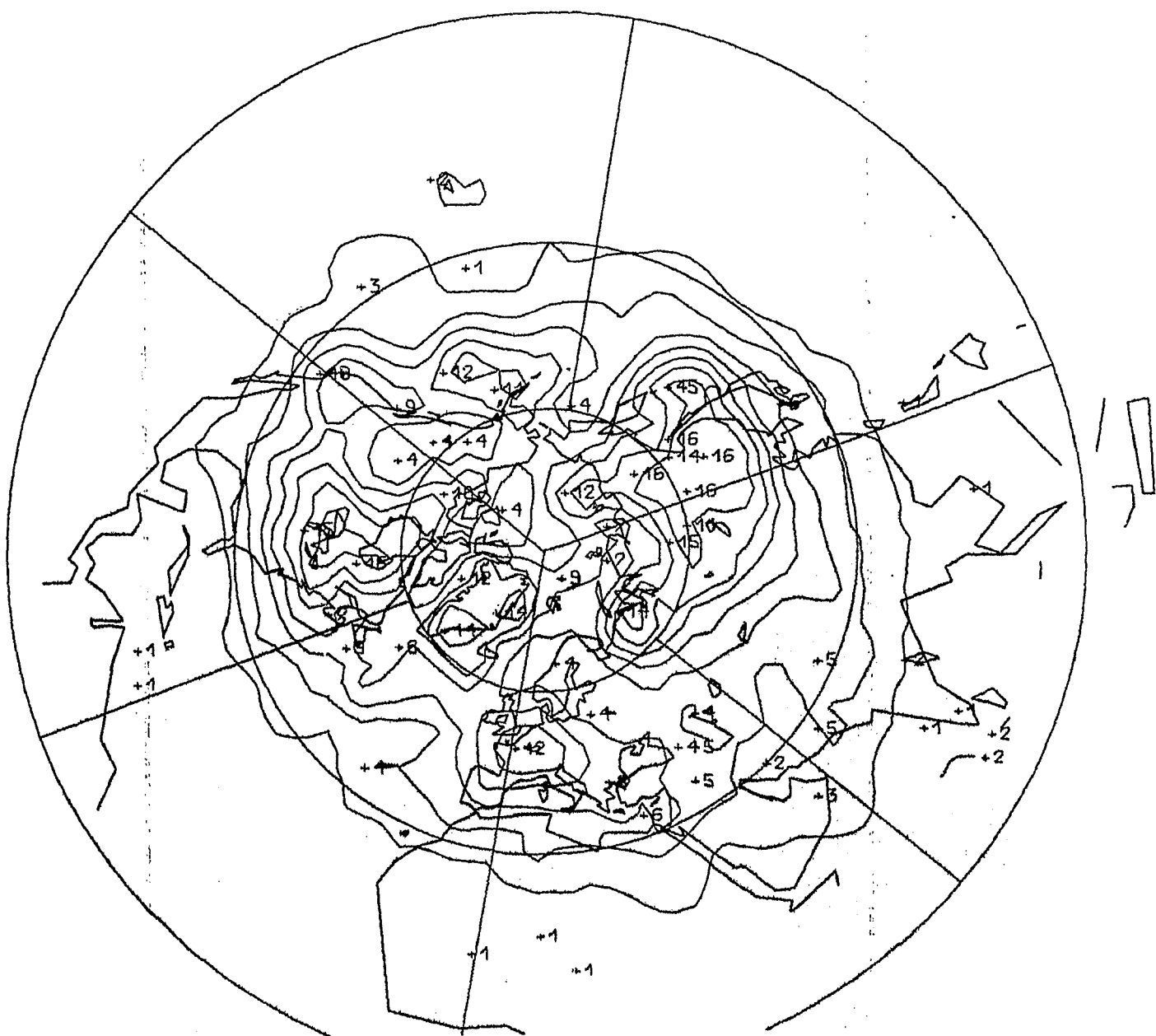
**A<sub>TE</sub>**

APRIL 1969

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.75

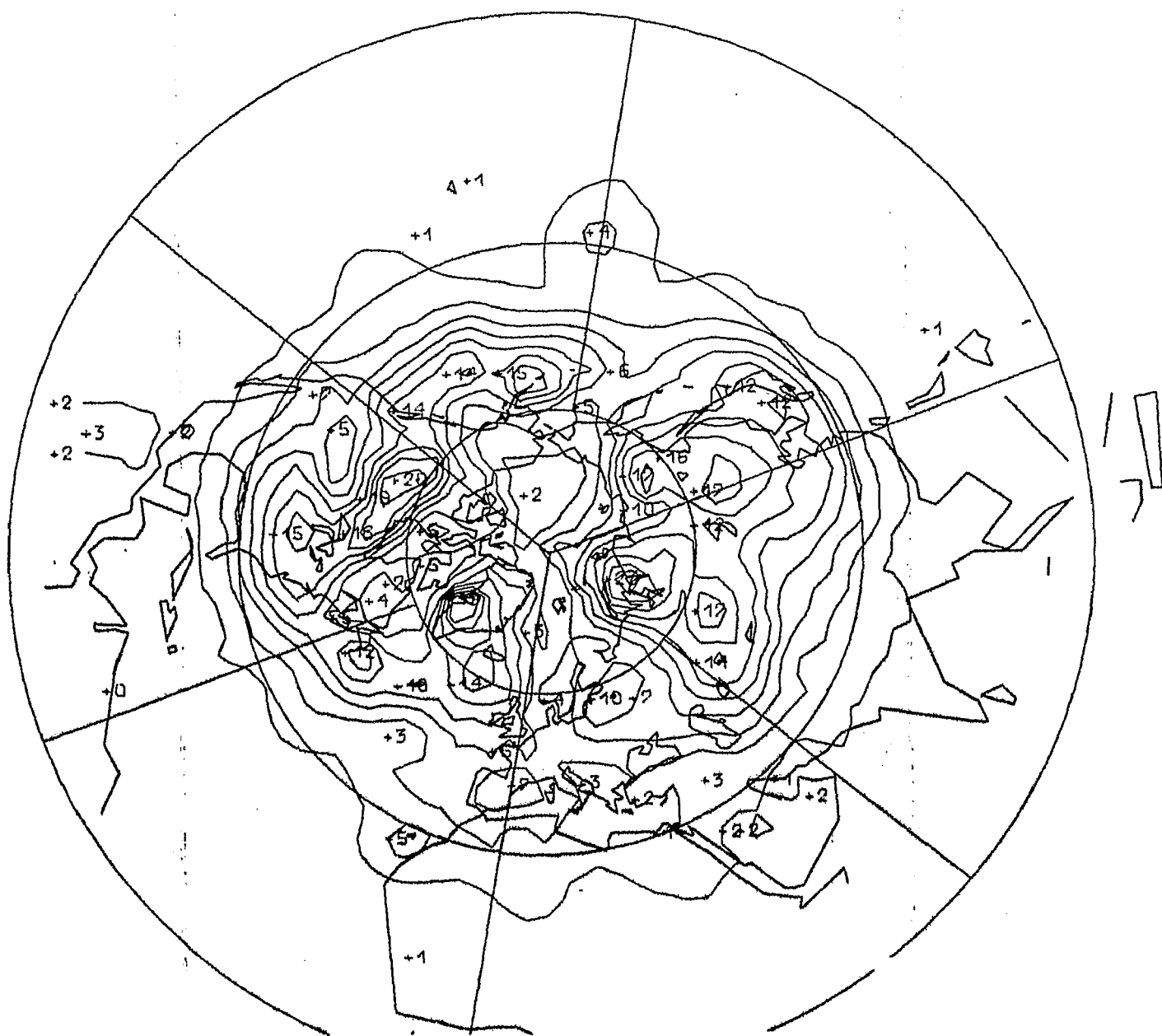




**A<sub>TE</sub>**      **APRIL 1970**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

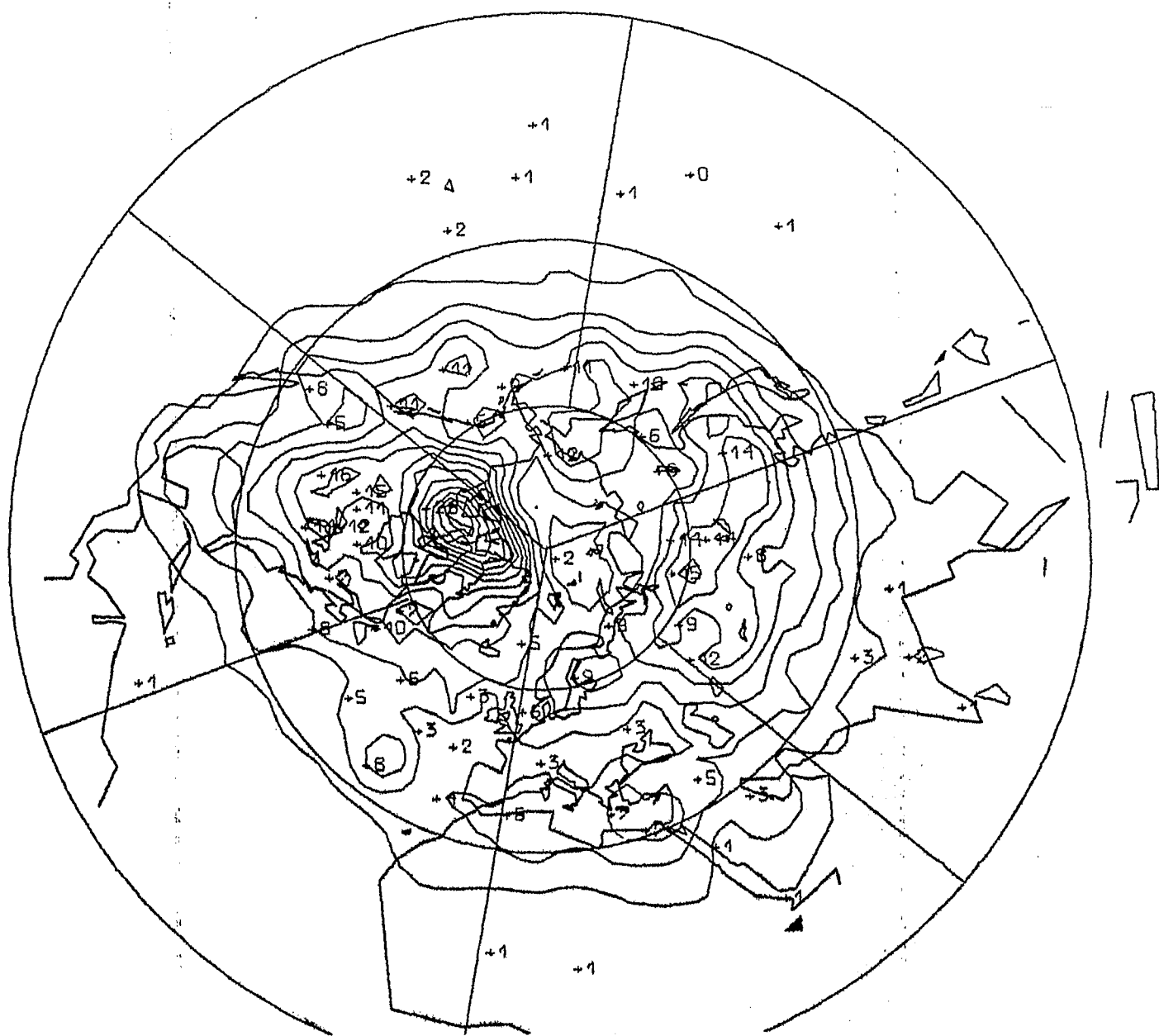
**Abb.76**



**A<sub>TE</sub>**      APRIL 1971

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

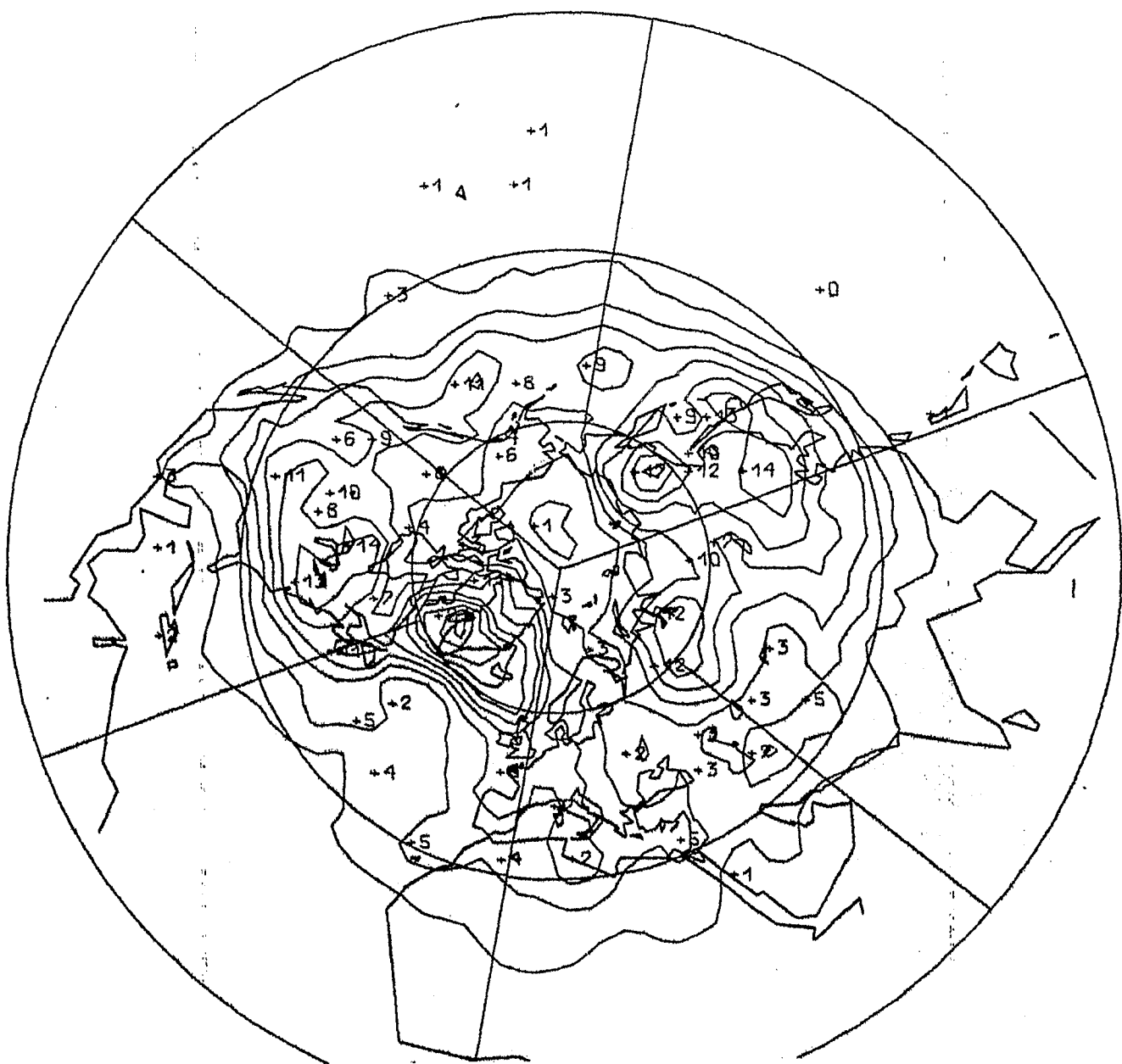
Abb.77



**A<sub>TE</sub>**      **APRIL 1972**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

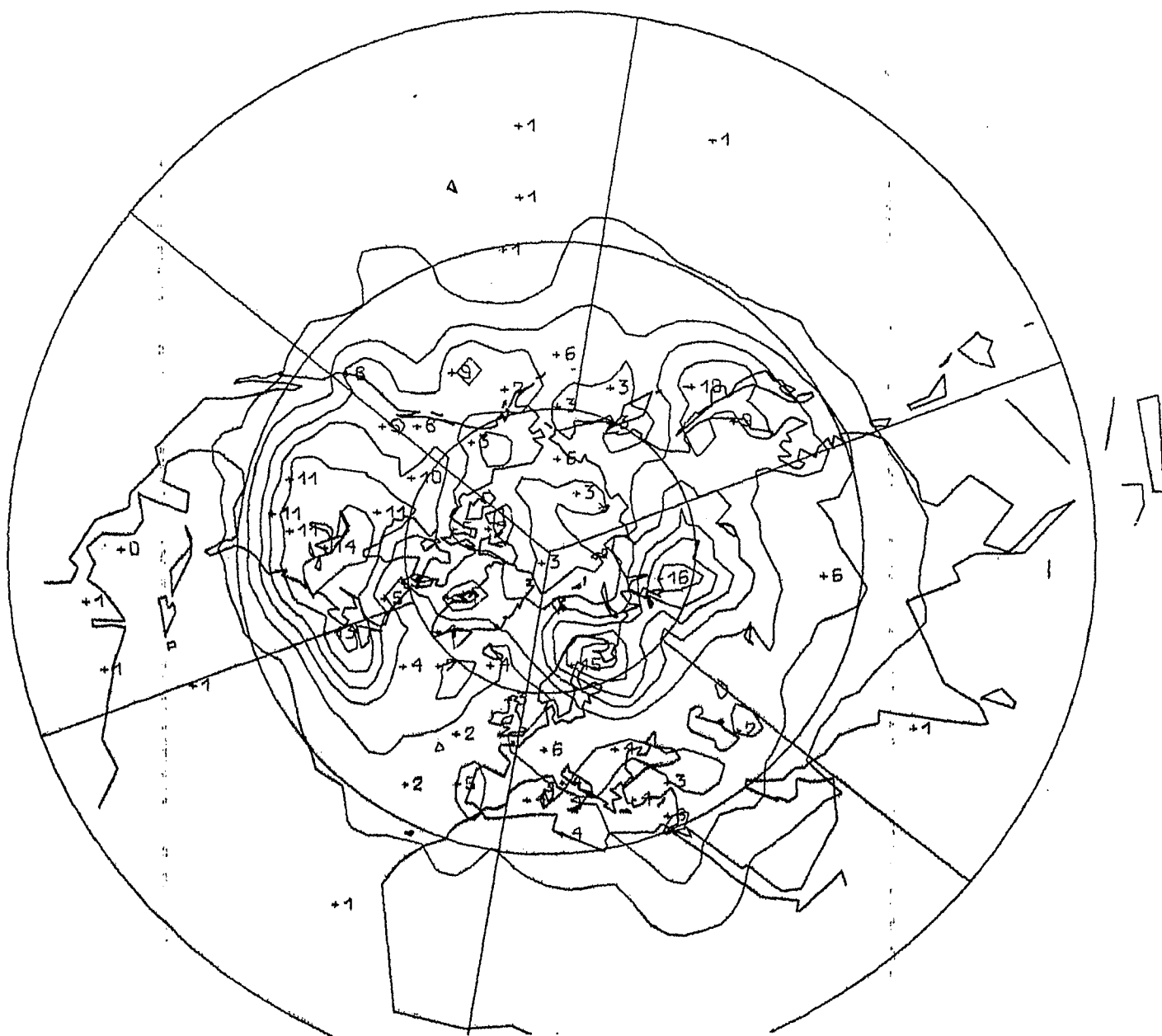
Abb.78



**A<sub>TE</sub>**      APRIL 1973

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.79

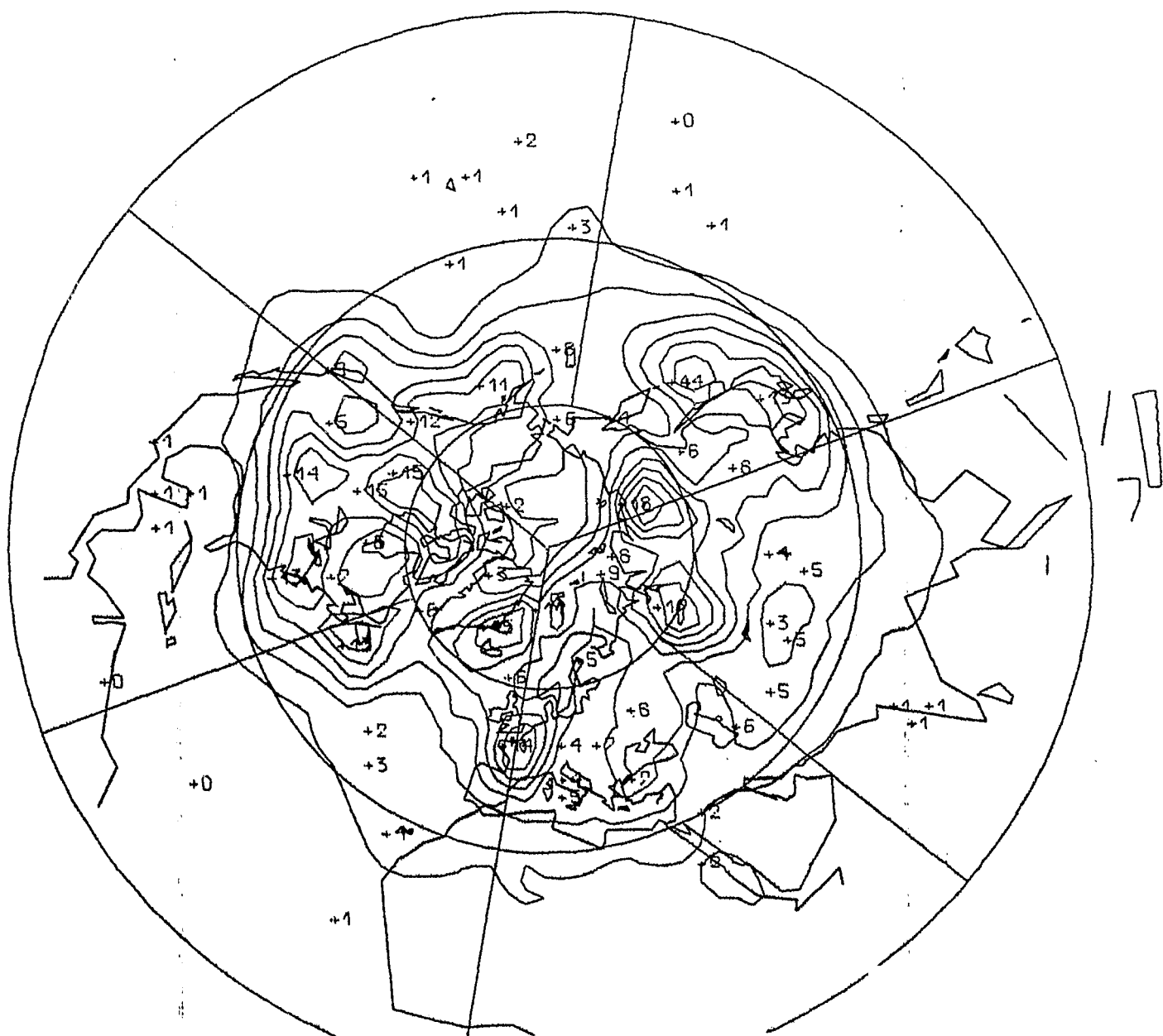


**A<sub>TE</sub>**

**APRIL 1974**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb.80**



**A<sub>TE</sub> APRIL 1975**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

Abb.81

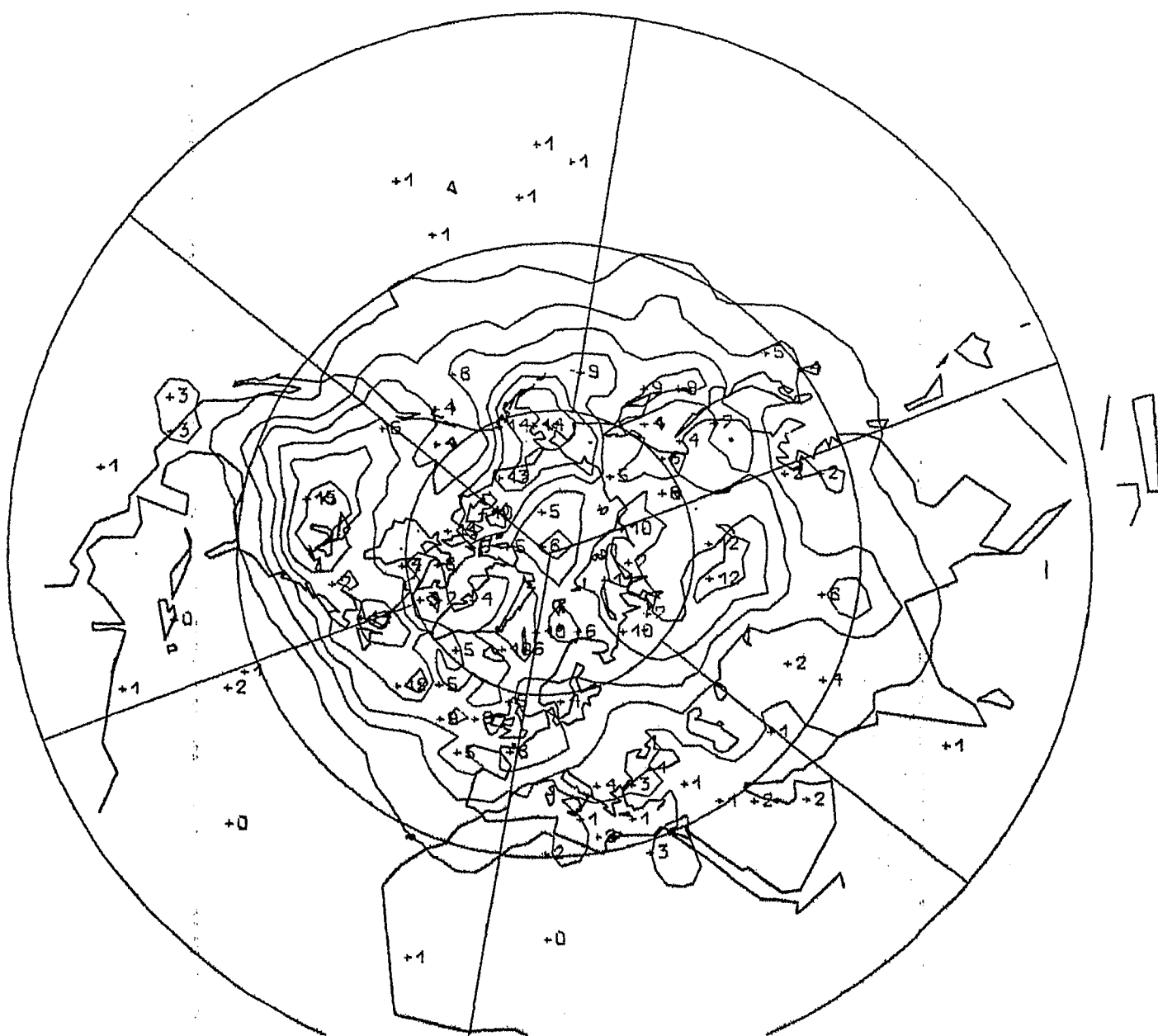


**A<sub>TE</sub>**

**APRIL 1976**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

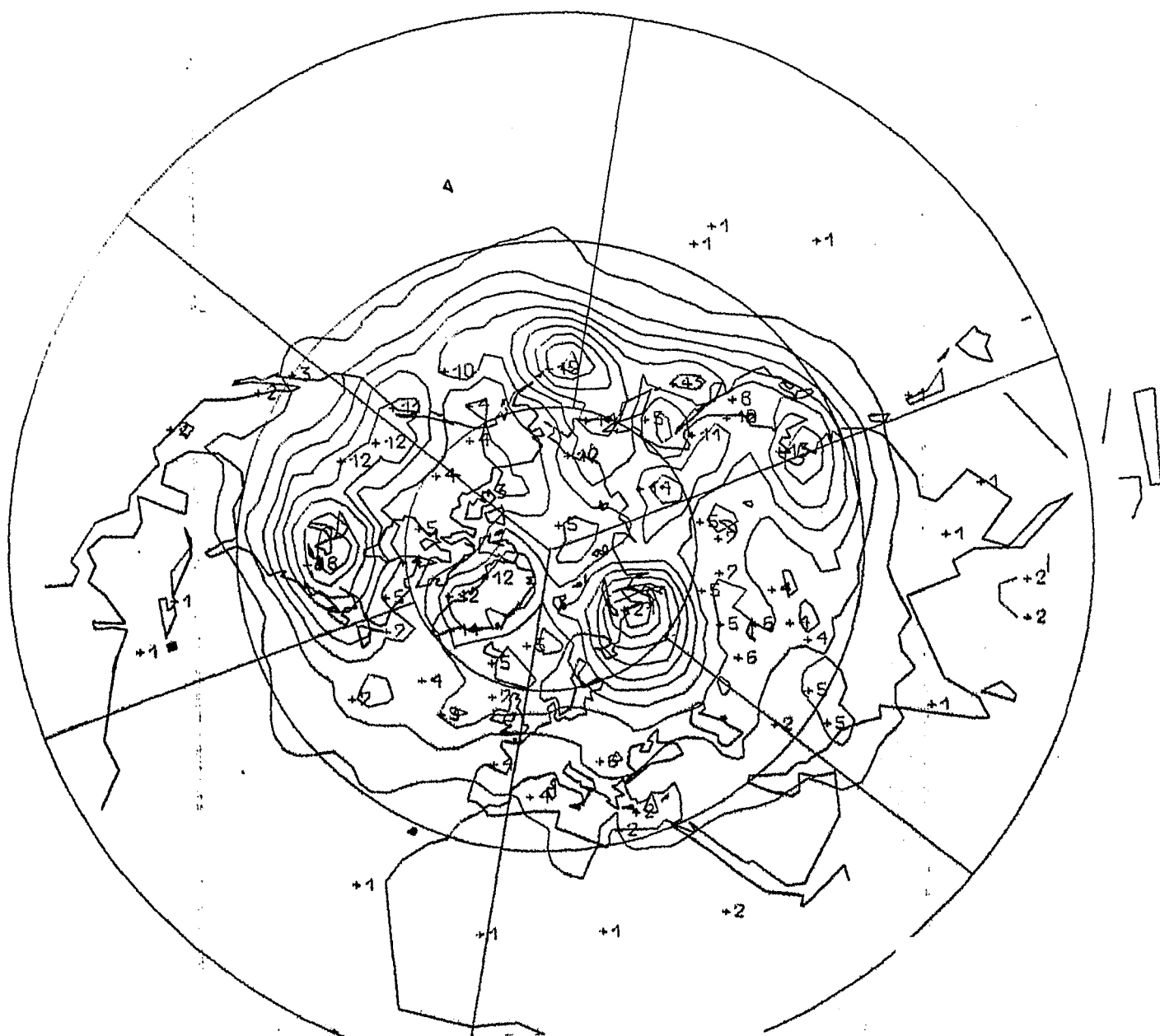
**Abb.82**



**$A_{TE}$**  OKT 1967  
 **$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

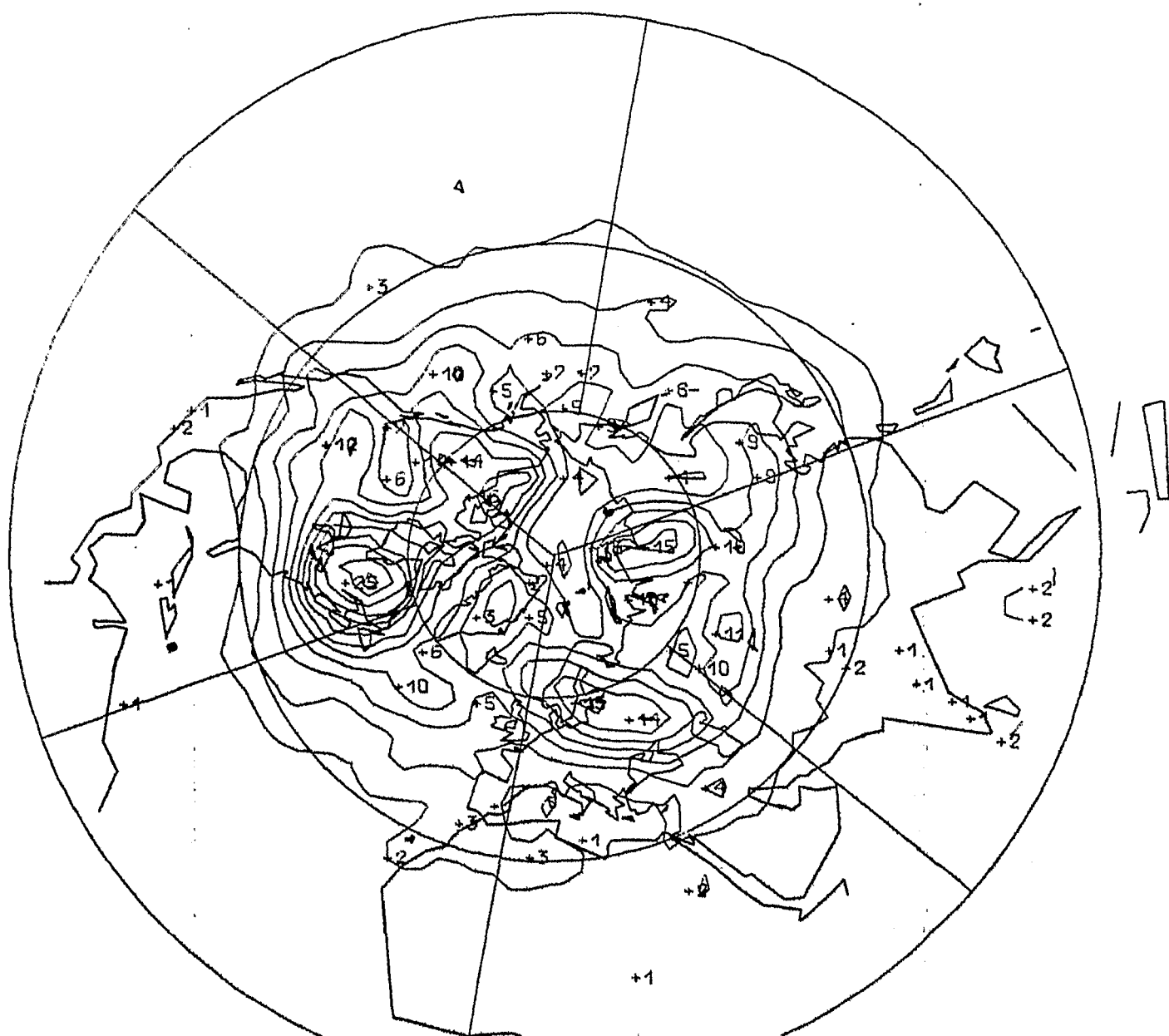
Abb.83





**A<sub>TE</sub> OKT 1968**  
 **$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

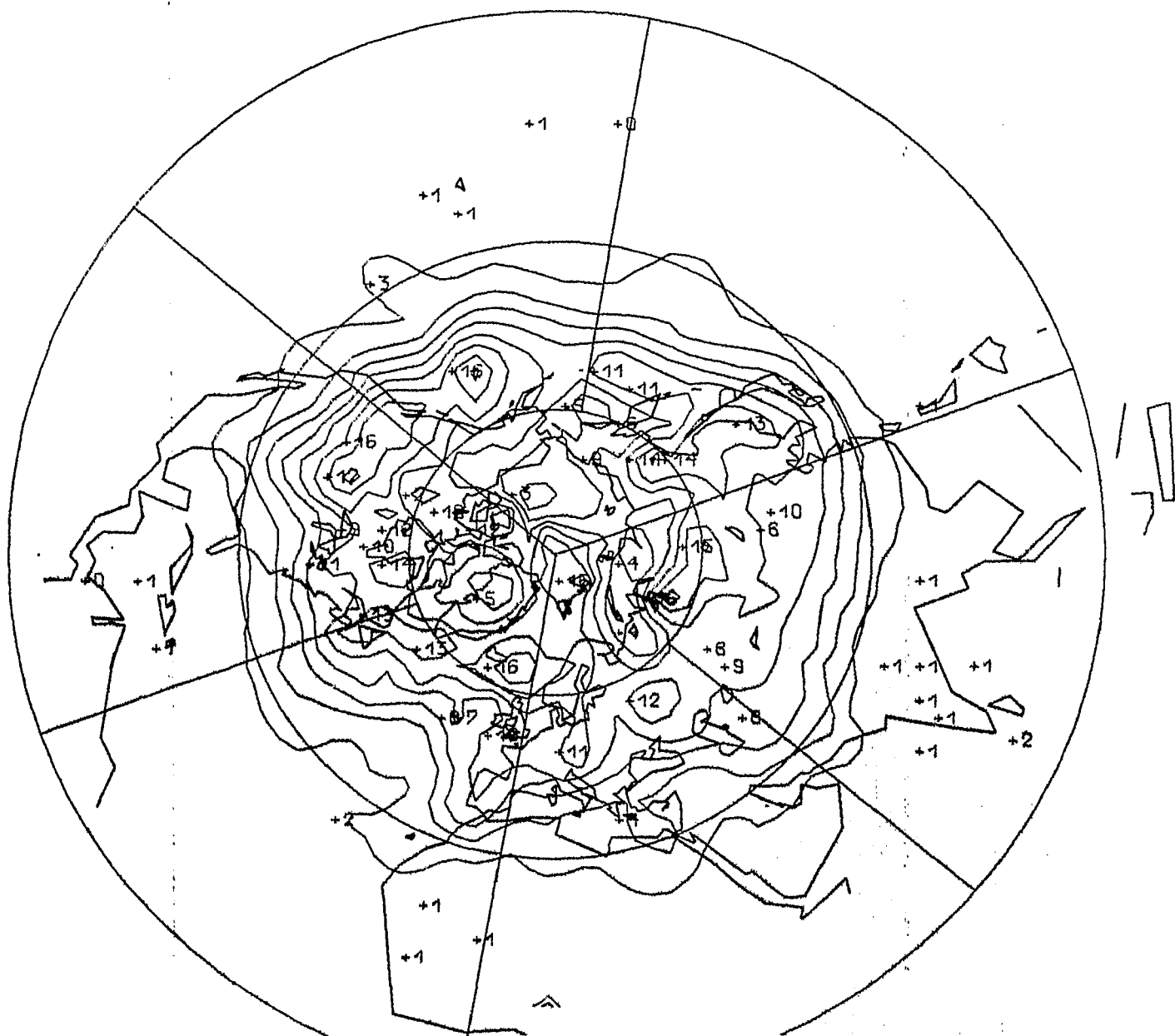
Abb .84



**A<sub>TE</sub> OKT 1969**

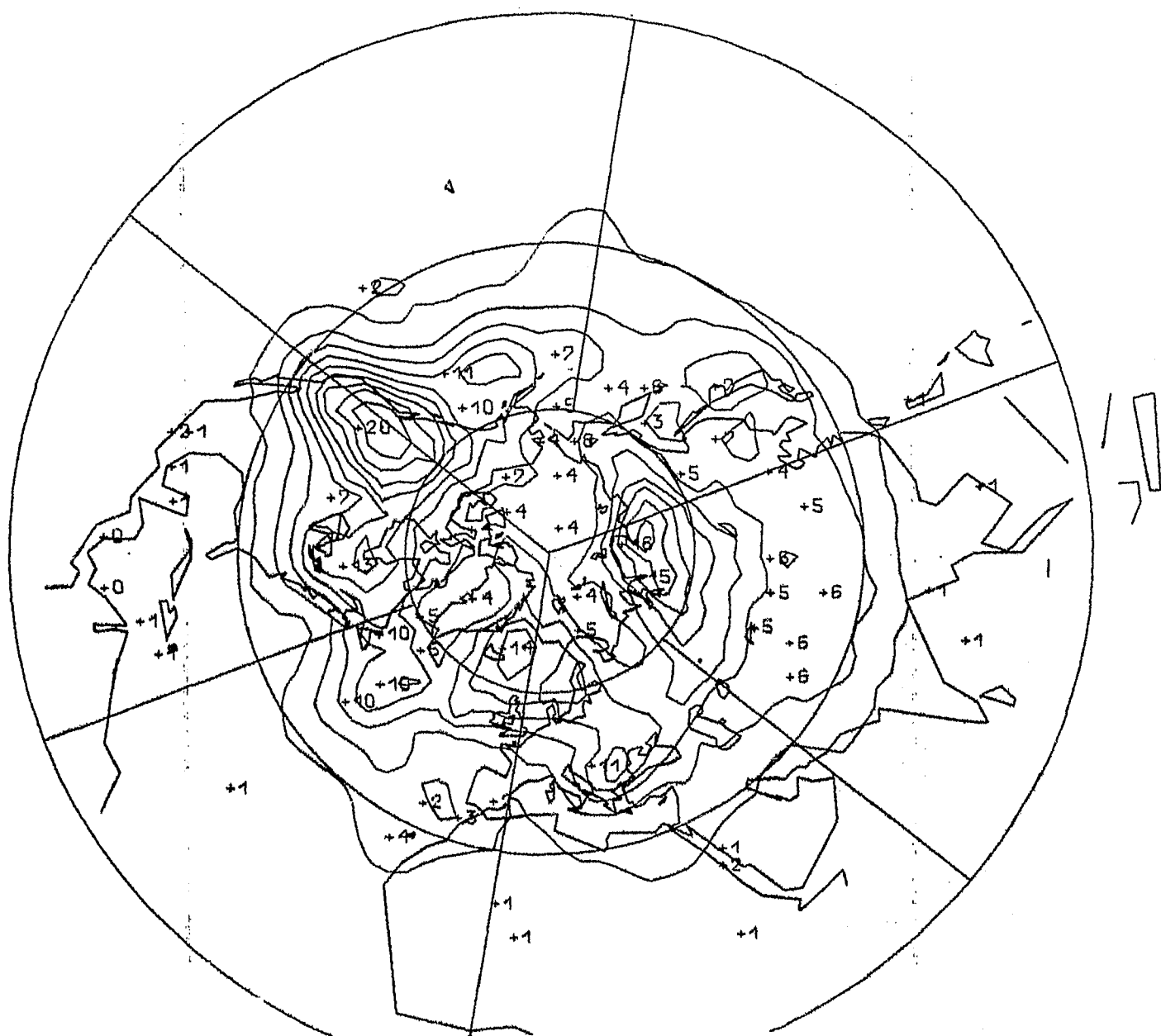
**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb.85**



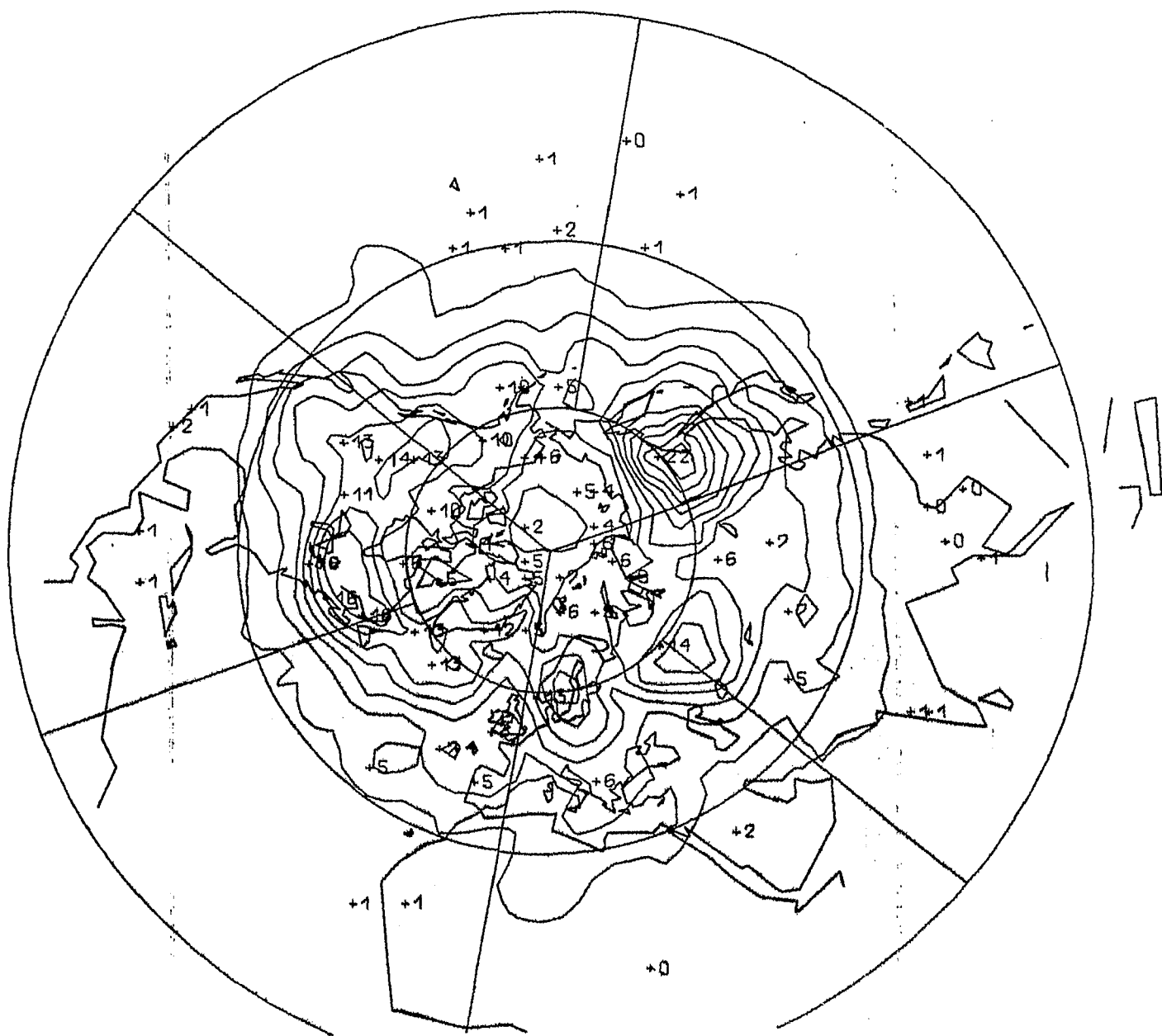
$A_{TE}$  OKT 1970  
 $10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$

Abb 86



**A<sub>TE</sub>** OKT. 1971  
 $10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$

Abb.87

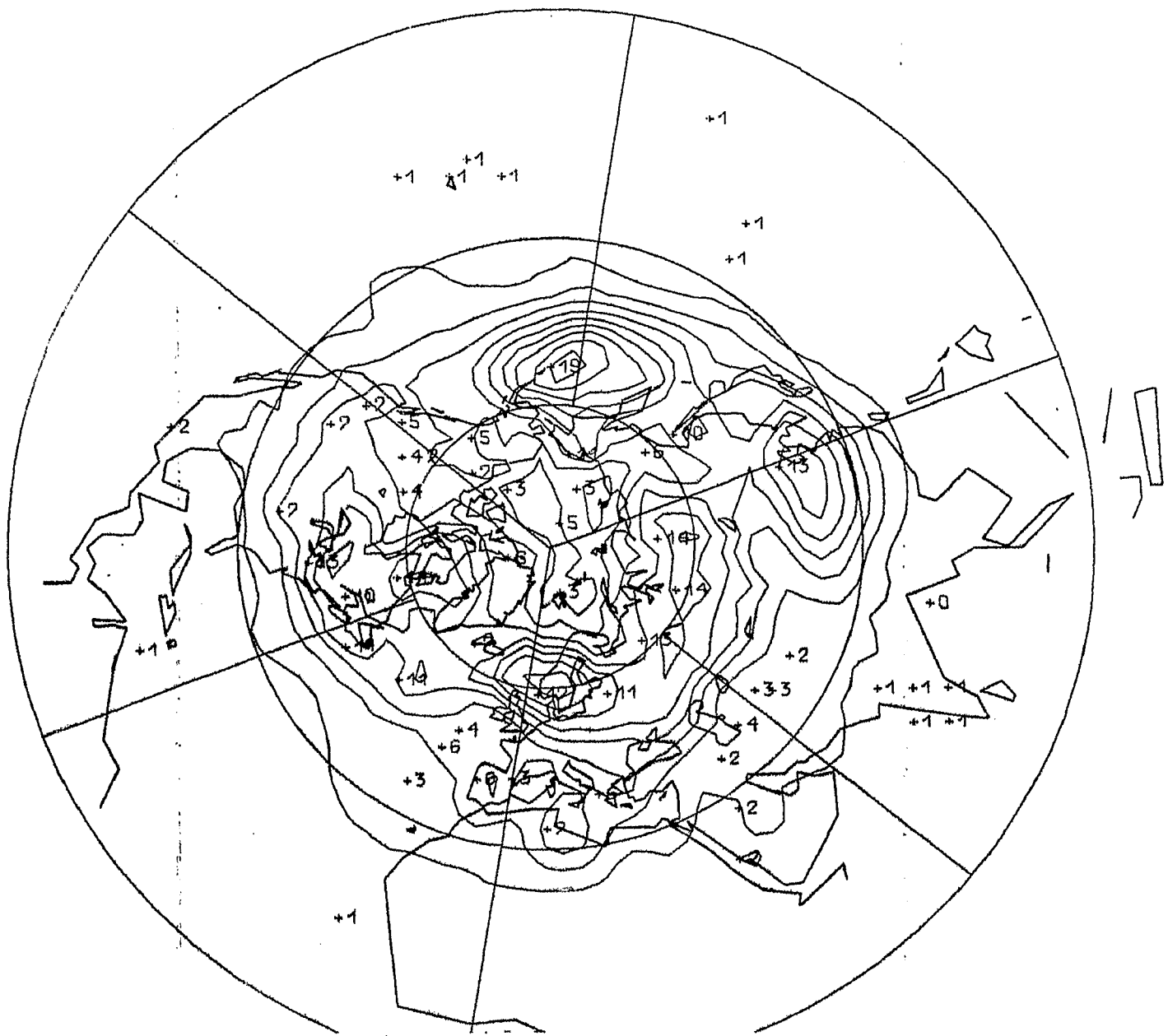


**A<sub>TE</sub>**

**OKT. 1972**

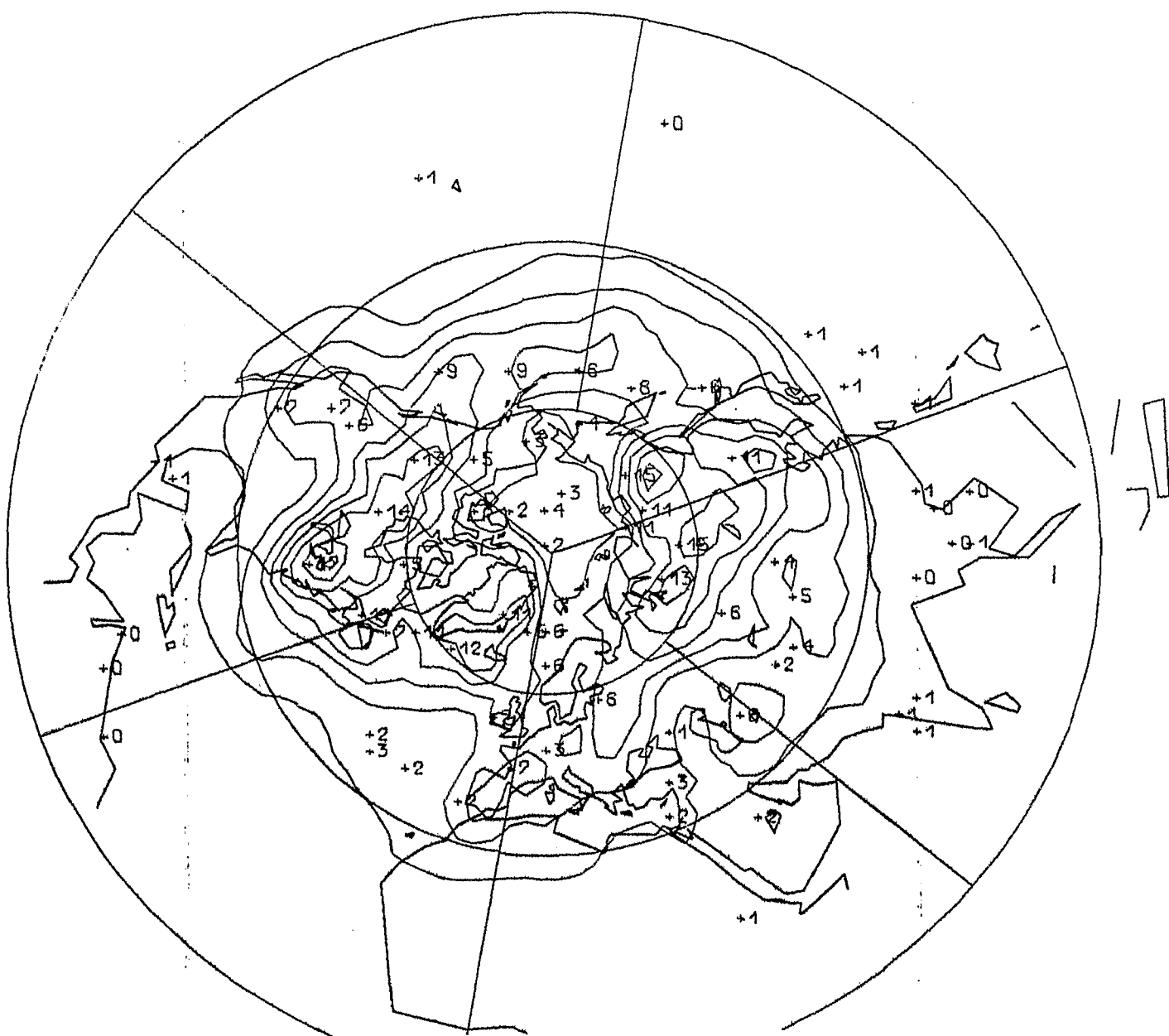
**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb.88**



$A_{TE}$  OKT 1973  
 $10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$

Abb.89

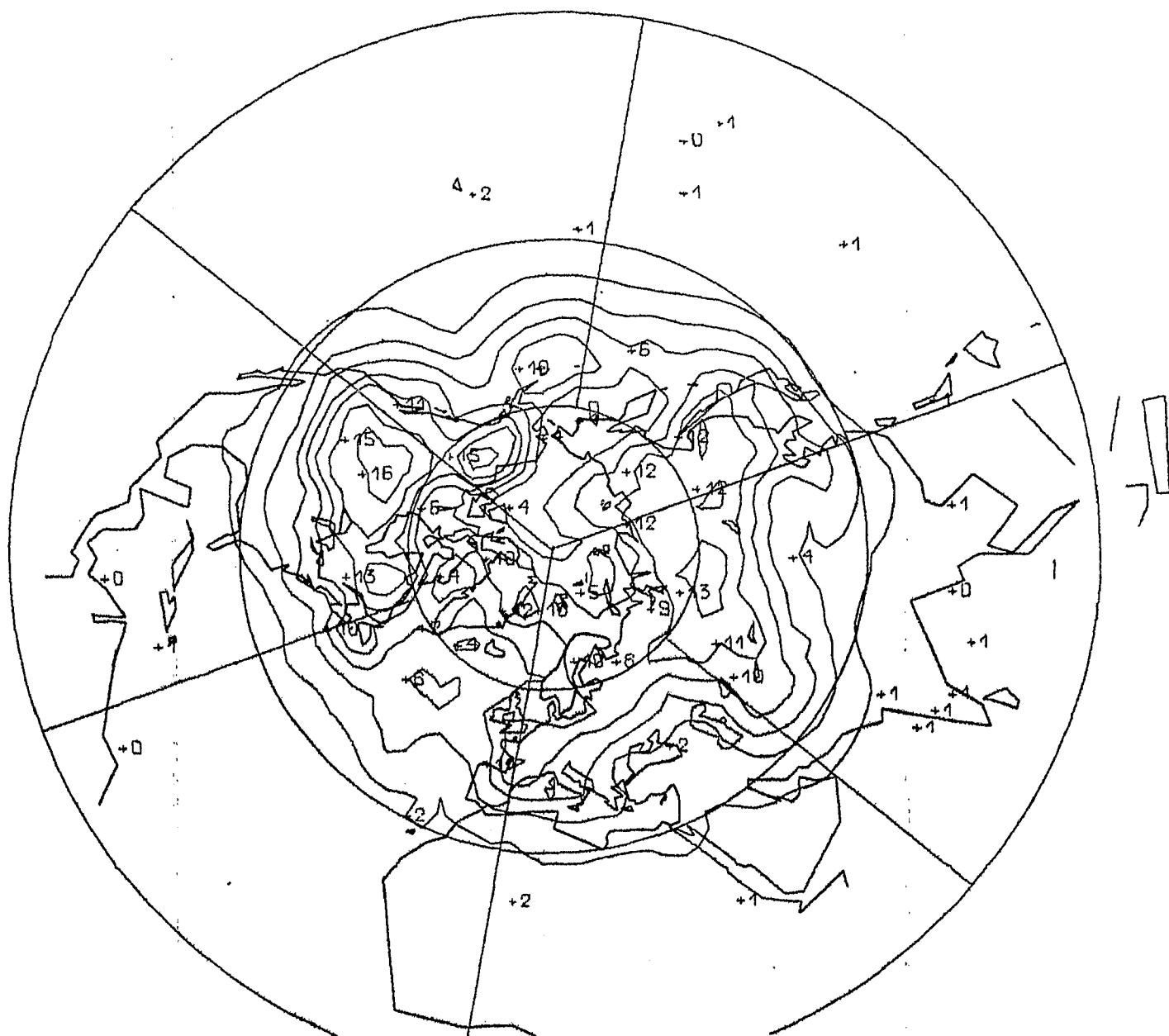


**A<sub>TE</sub>**

**OKT. 1974**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

**Abb.90**

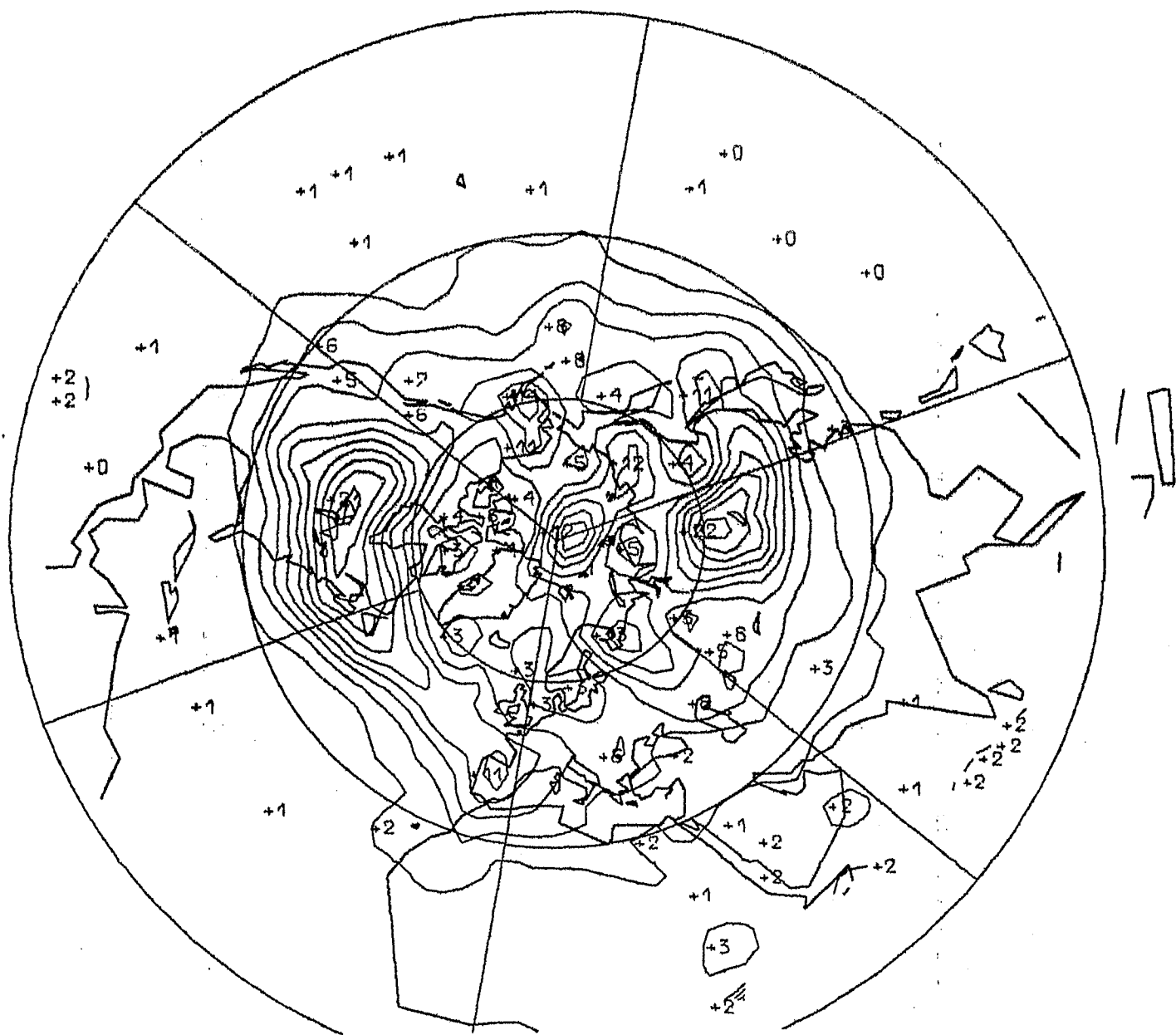


**A<sub>TE</sub> OKT. 1975**

**$10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$**

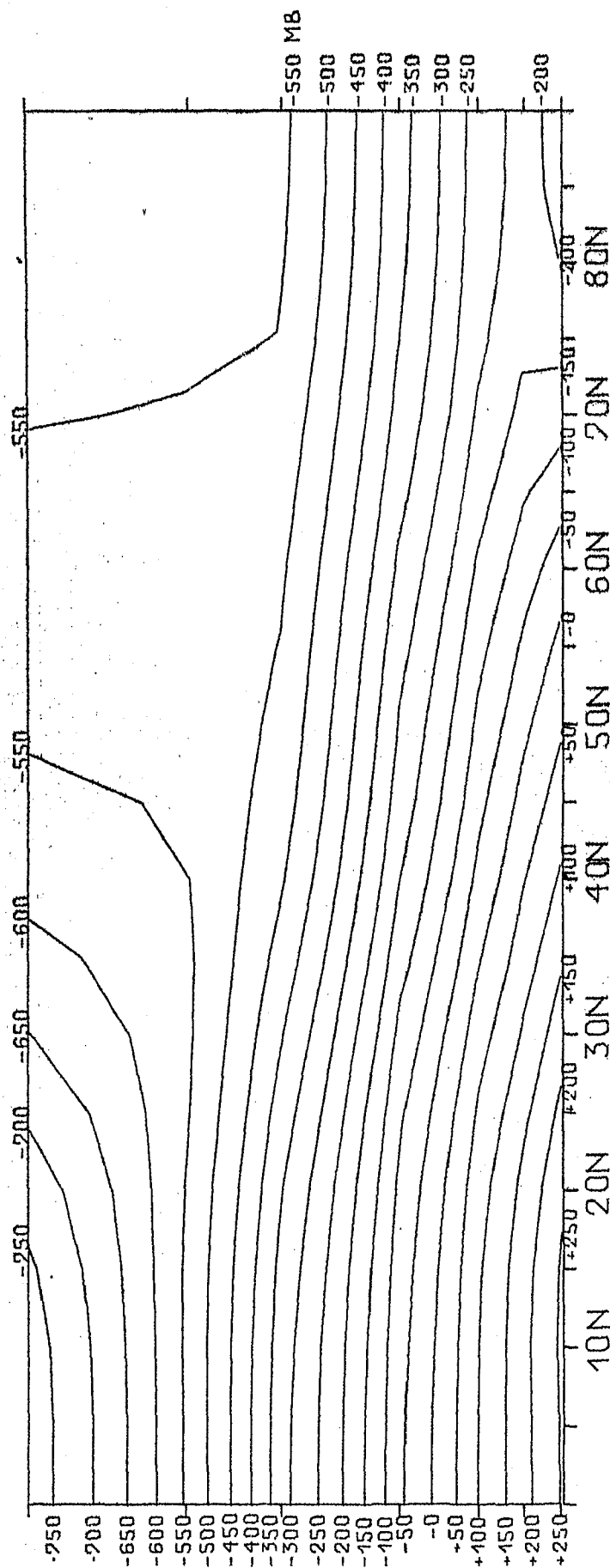
Abb.91





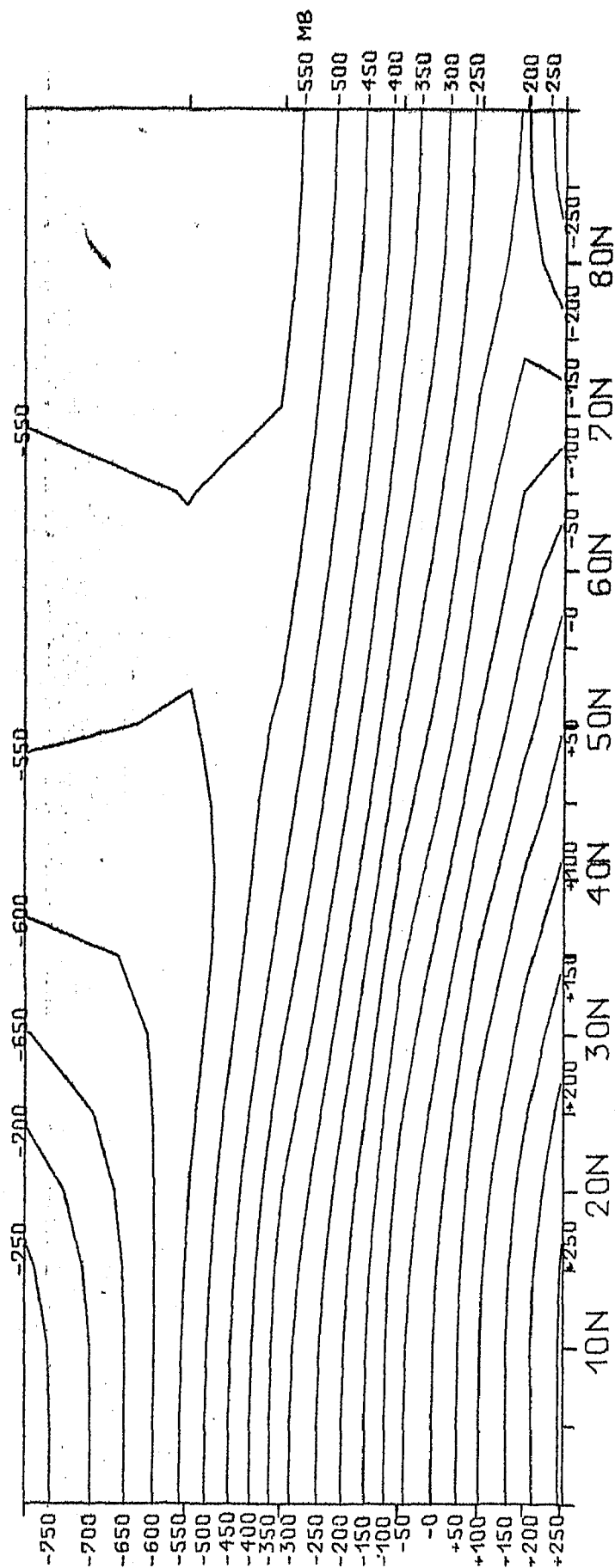
$A_{TE}$  OKT. 1976  
 $10^{-2} \text{ J CM}^{-2} \text{ MB}^{-1}$

KENNZIFFER: 34046700



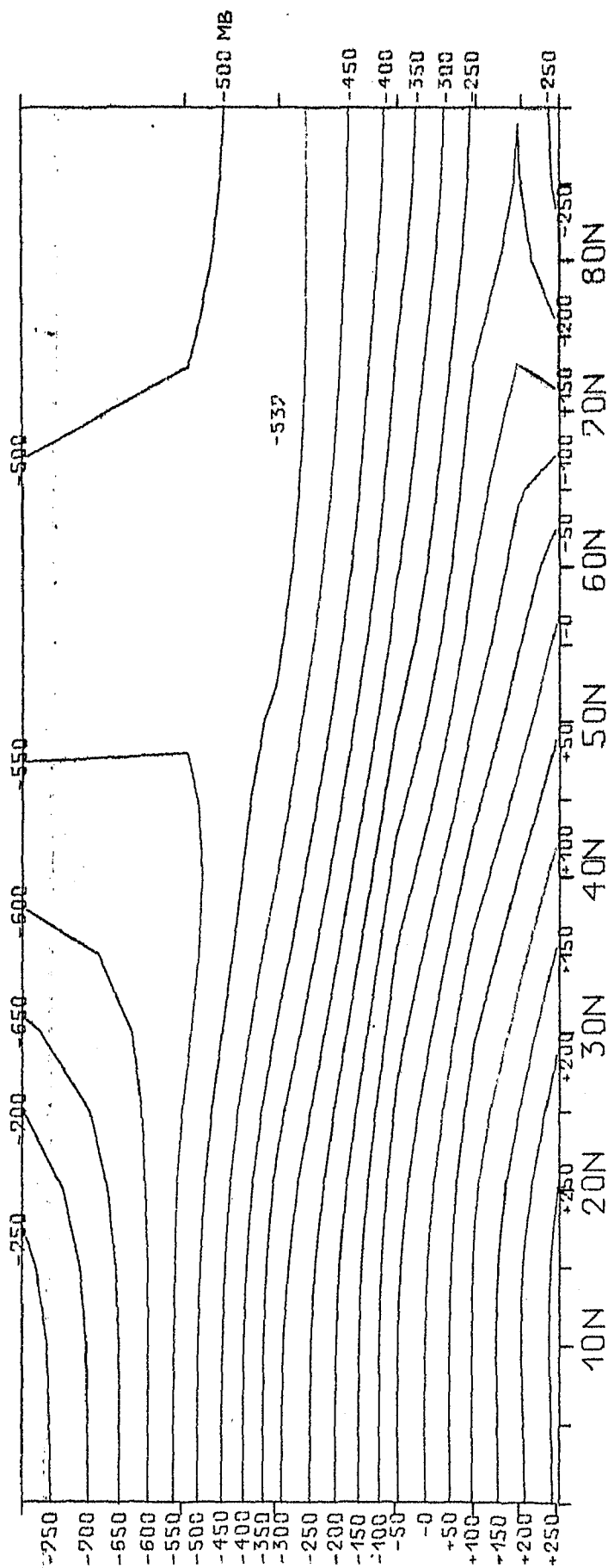
$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 67

KENNZIFFER: 34046800



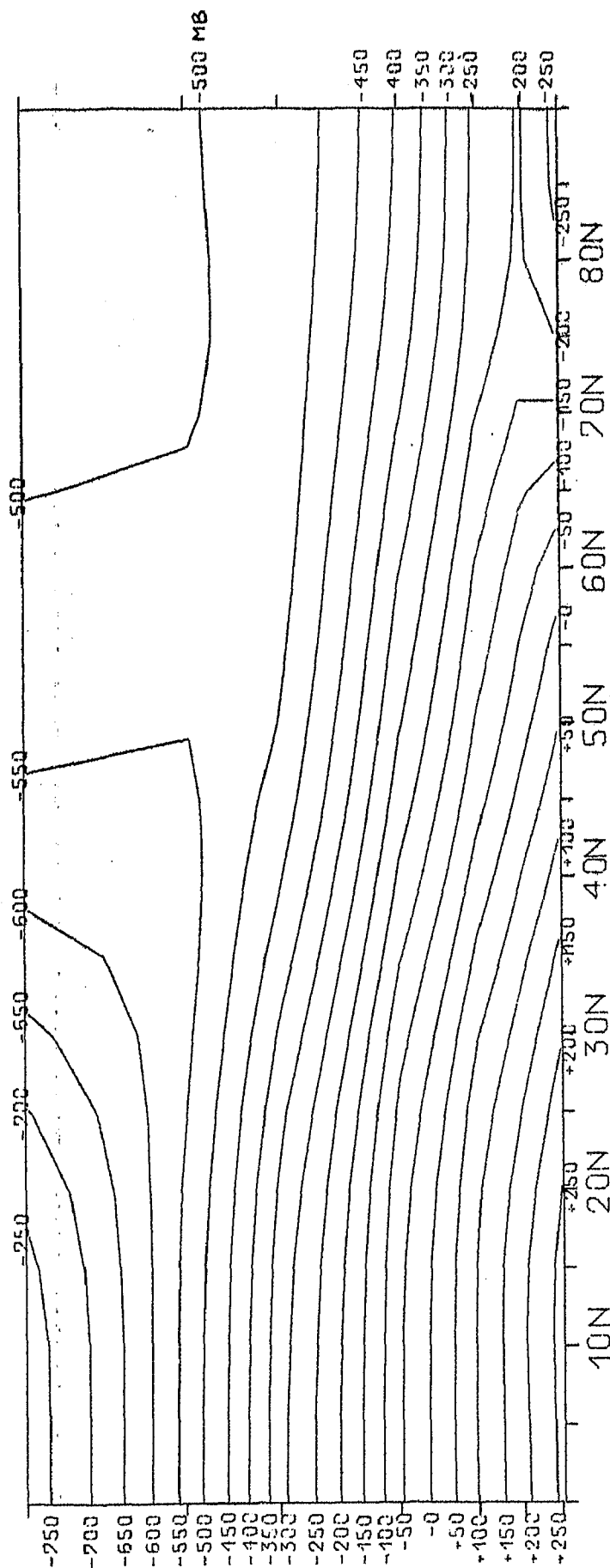
$[T]_{(N)}$  IN 1/10 GRAD C APRIL 68

KENNZIFFER: 34046900



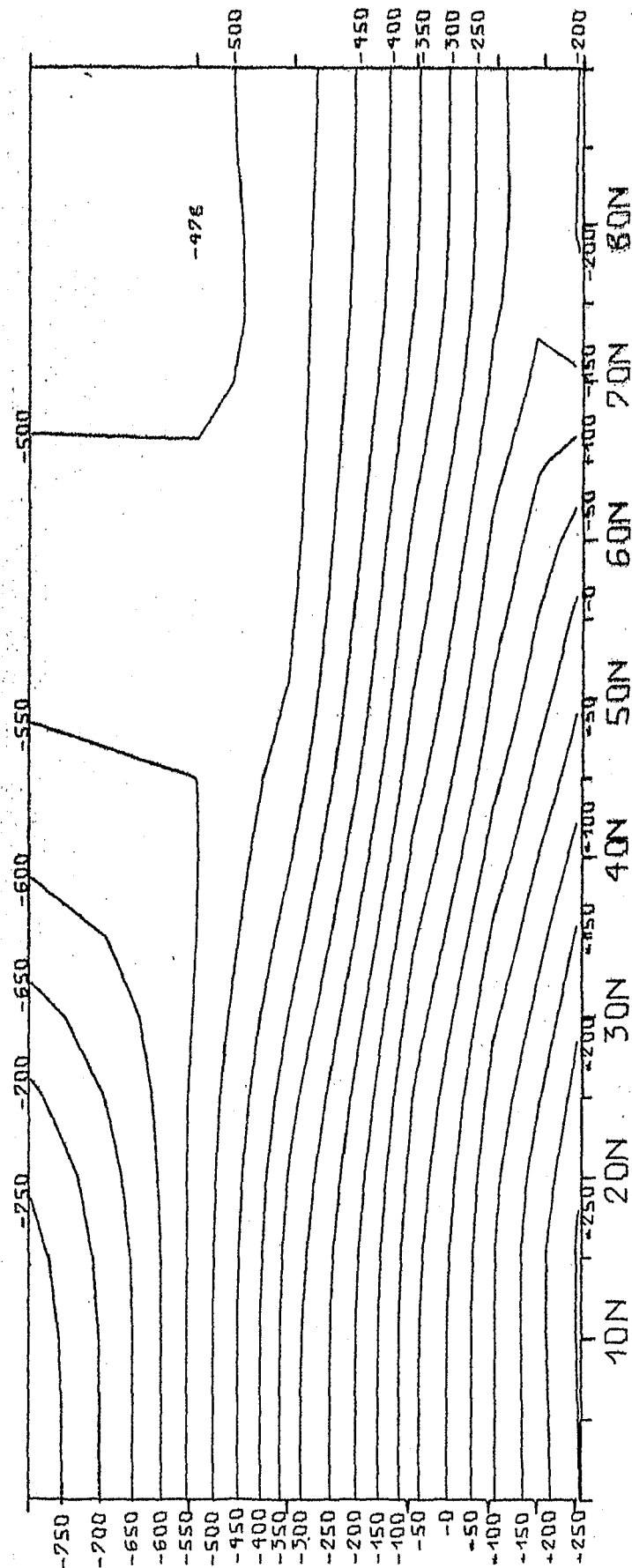
$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 69

KENNZIFFER: 34047000



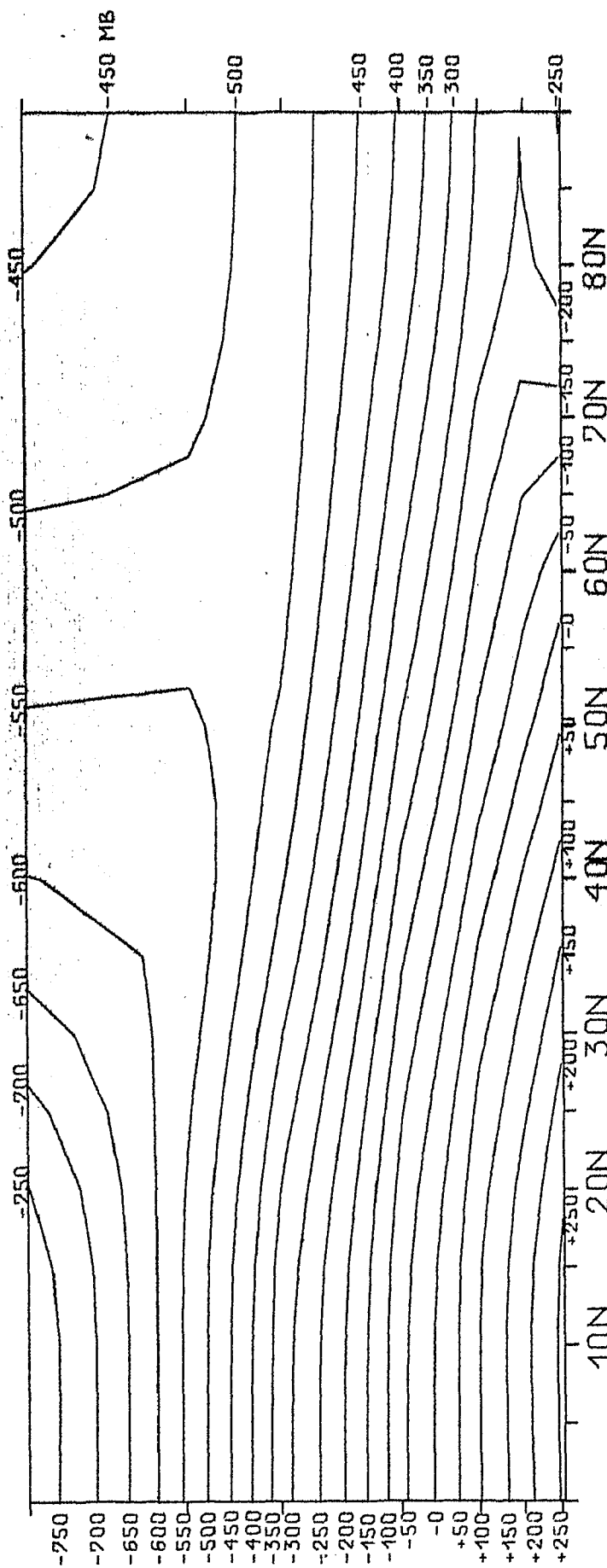
$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 70

KENNZIFFER: 34047100



$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 71

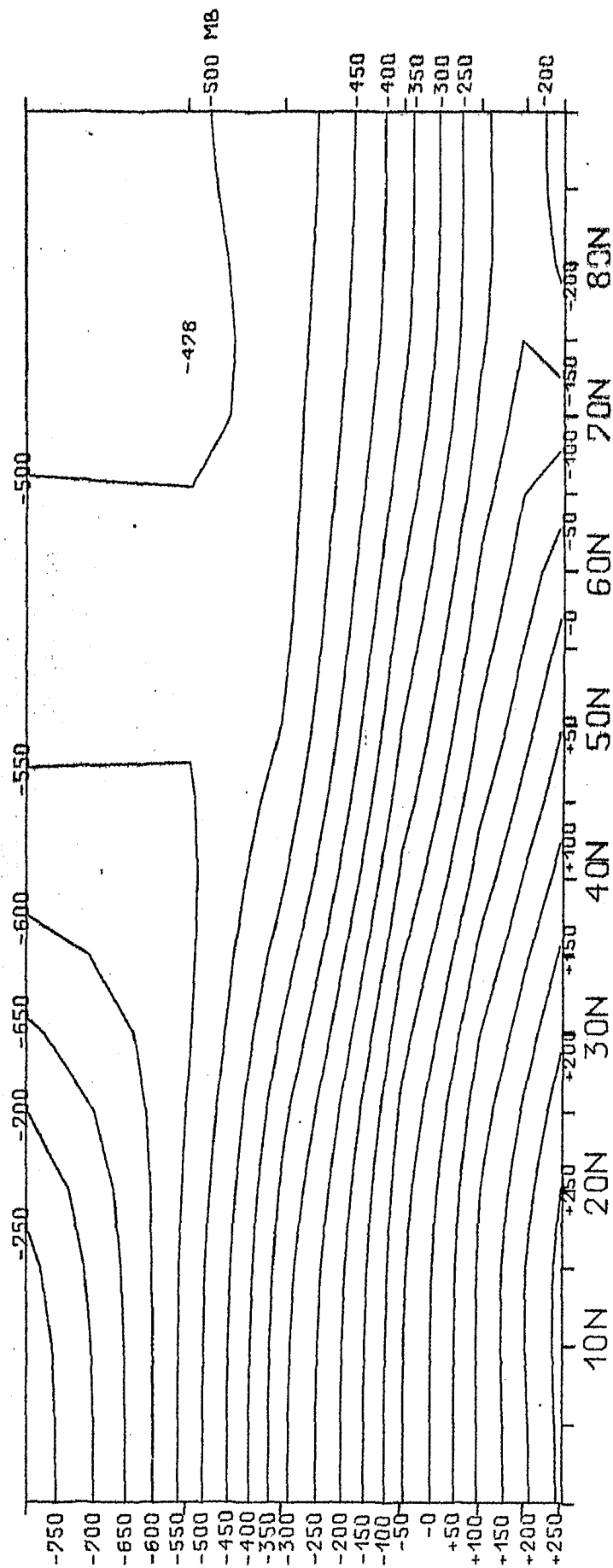
KENNZIFFER: 34047200



$[T]_{(\lambda)}$  IN  $1/10$  GRAD C APRIL 72

Abb.98

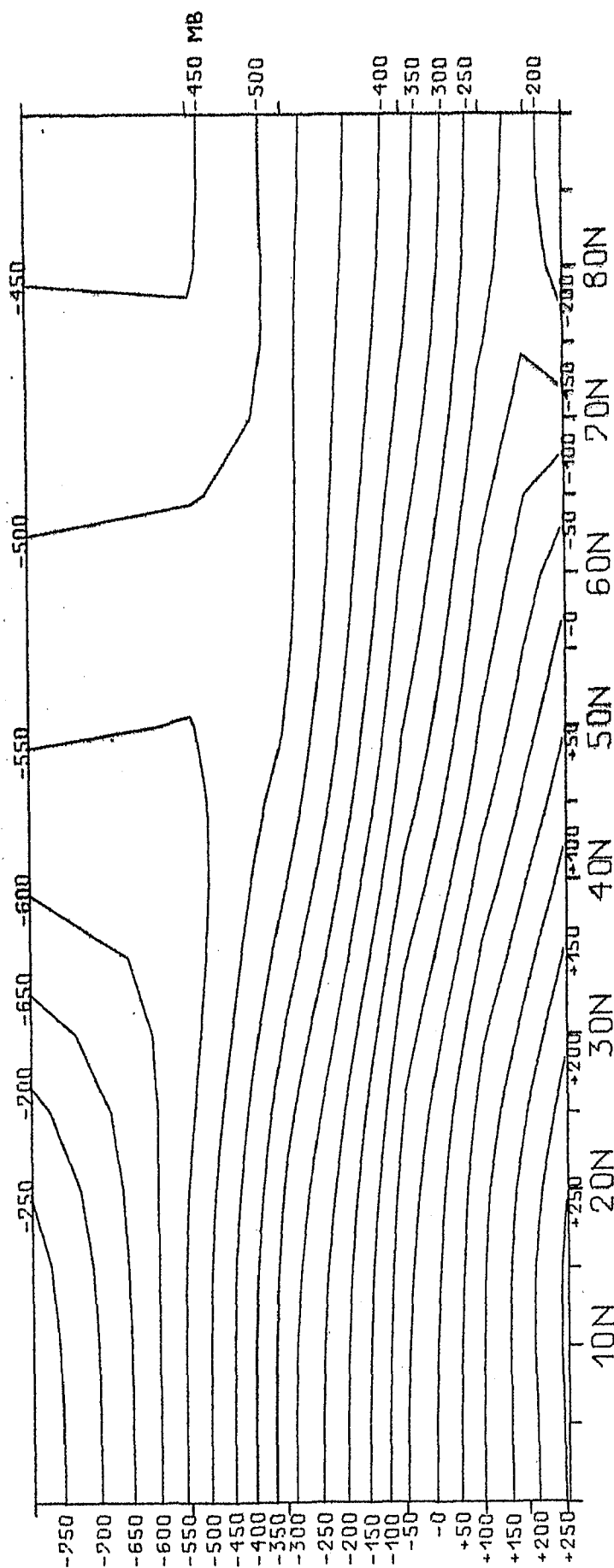
KENNZIFFER: 34047300



$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 73

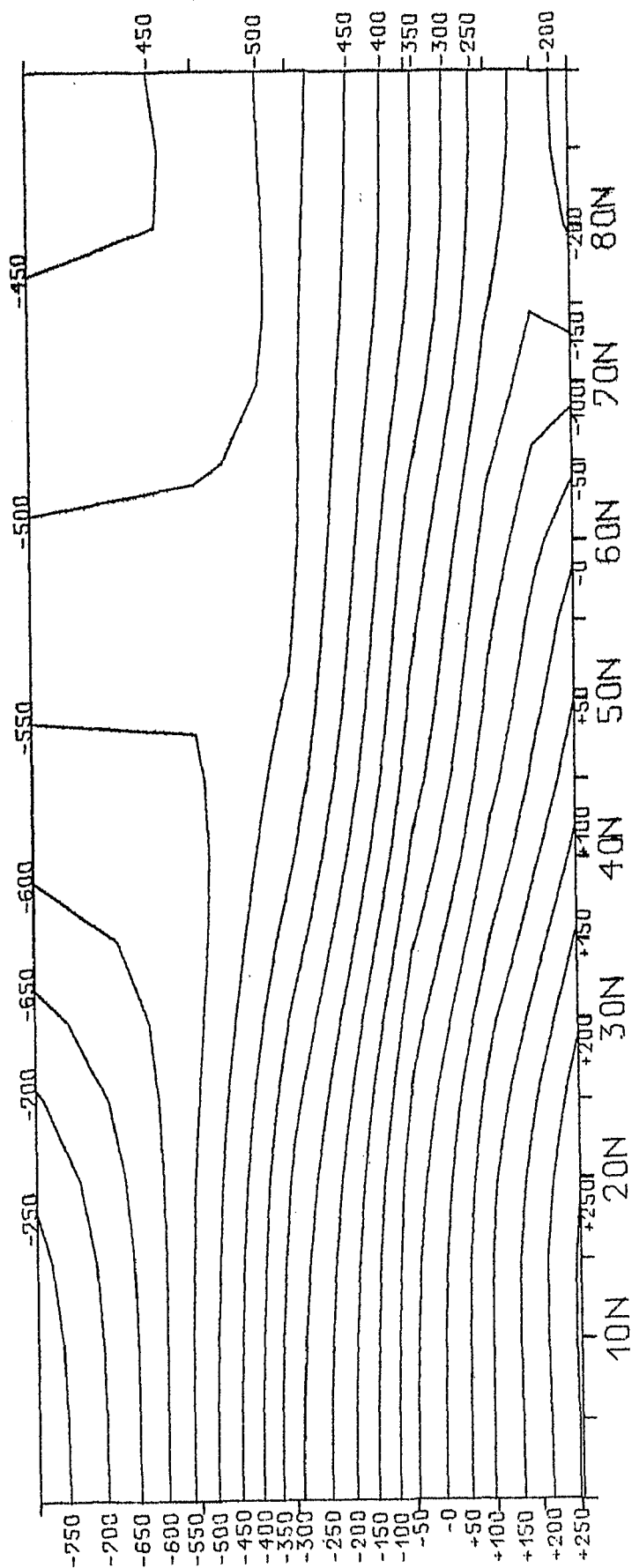


KENNZIFFER: 34047400



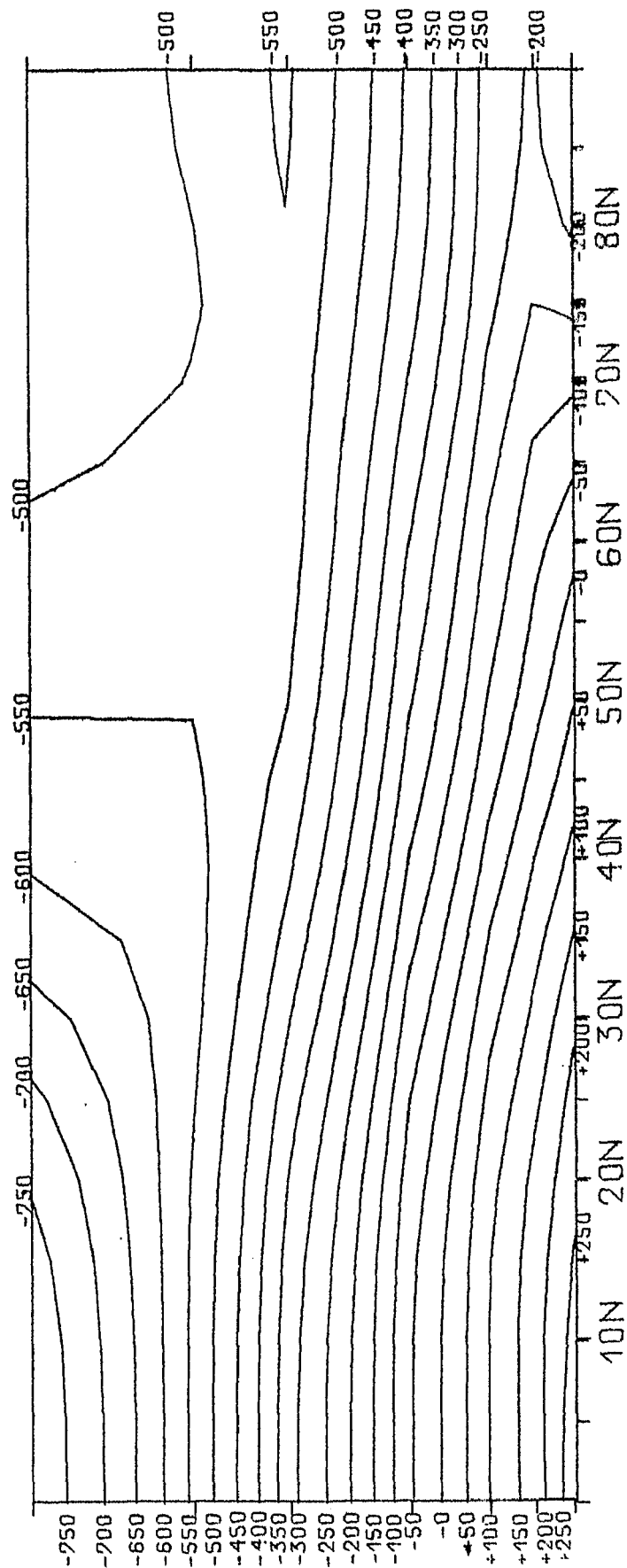
$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 74

KENNZIFFER: 34047500



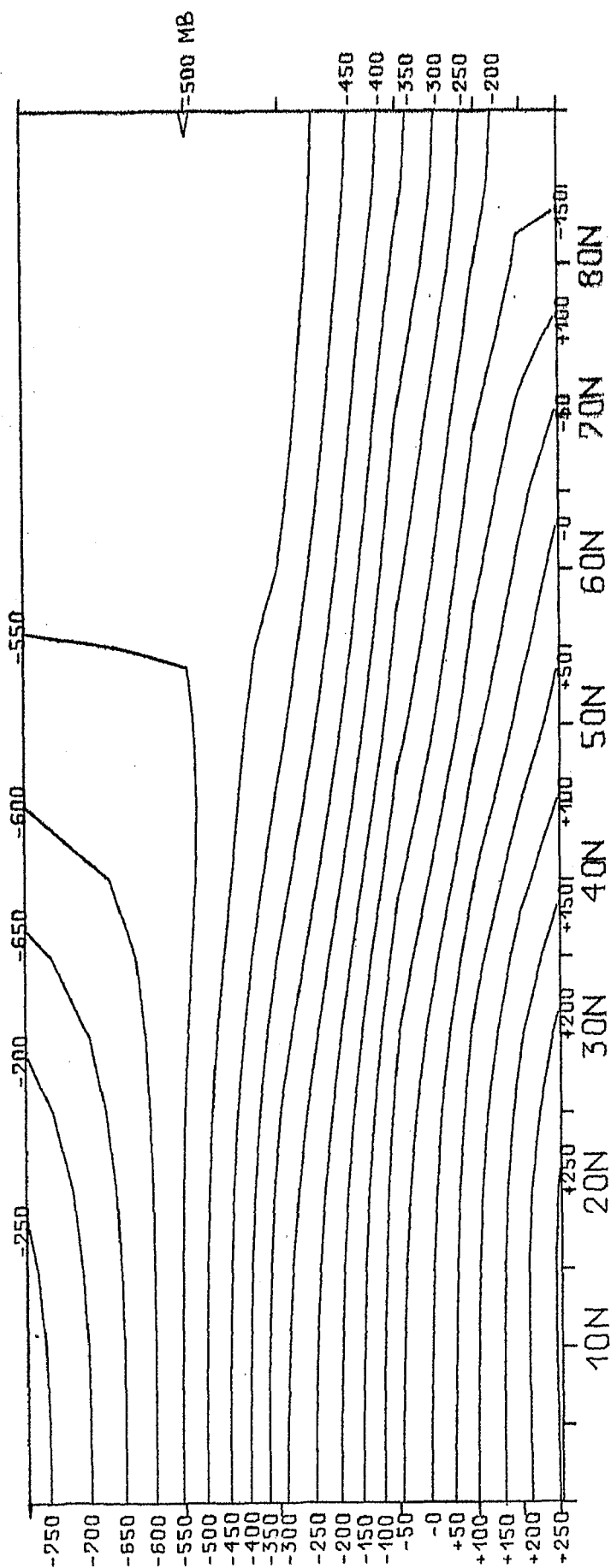
$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 75

KENNZIFFER: 34047600



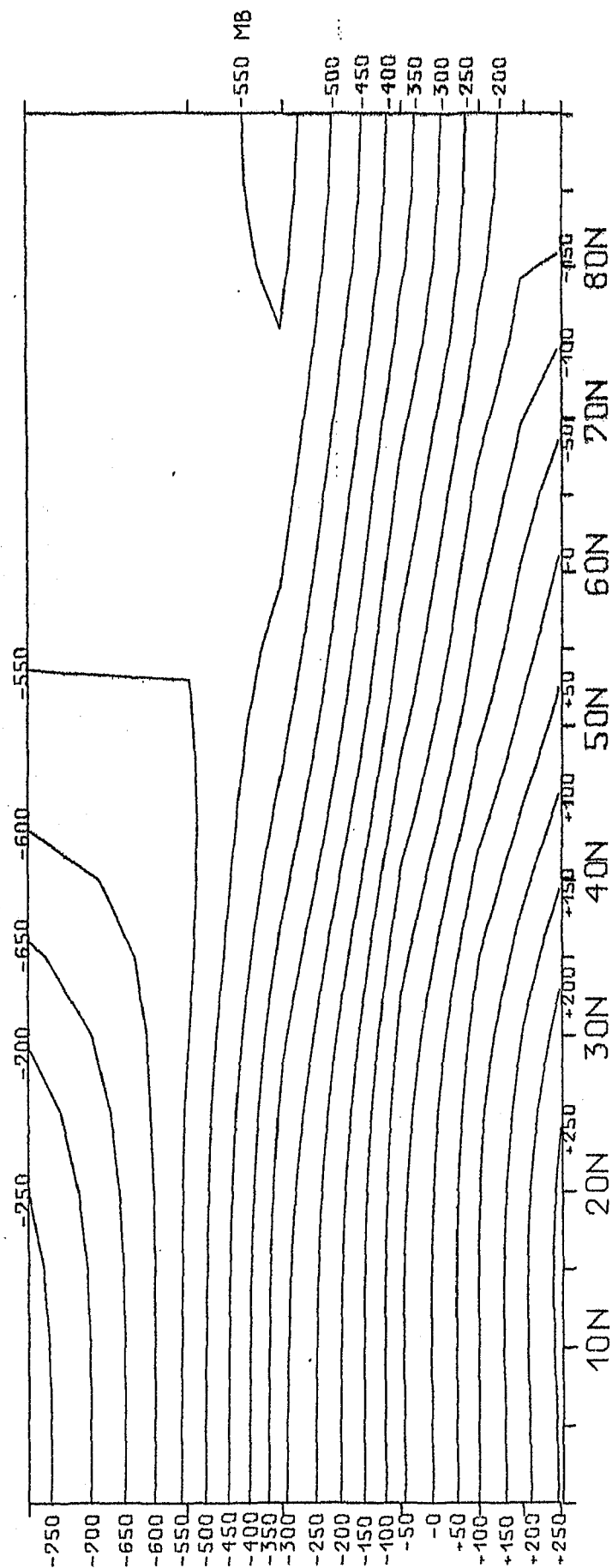
$[T]_{(\lambda)}$  IN 1/10 GRAD C APRIL 76

KENNZIFFER: 34106700



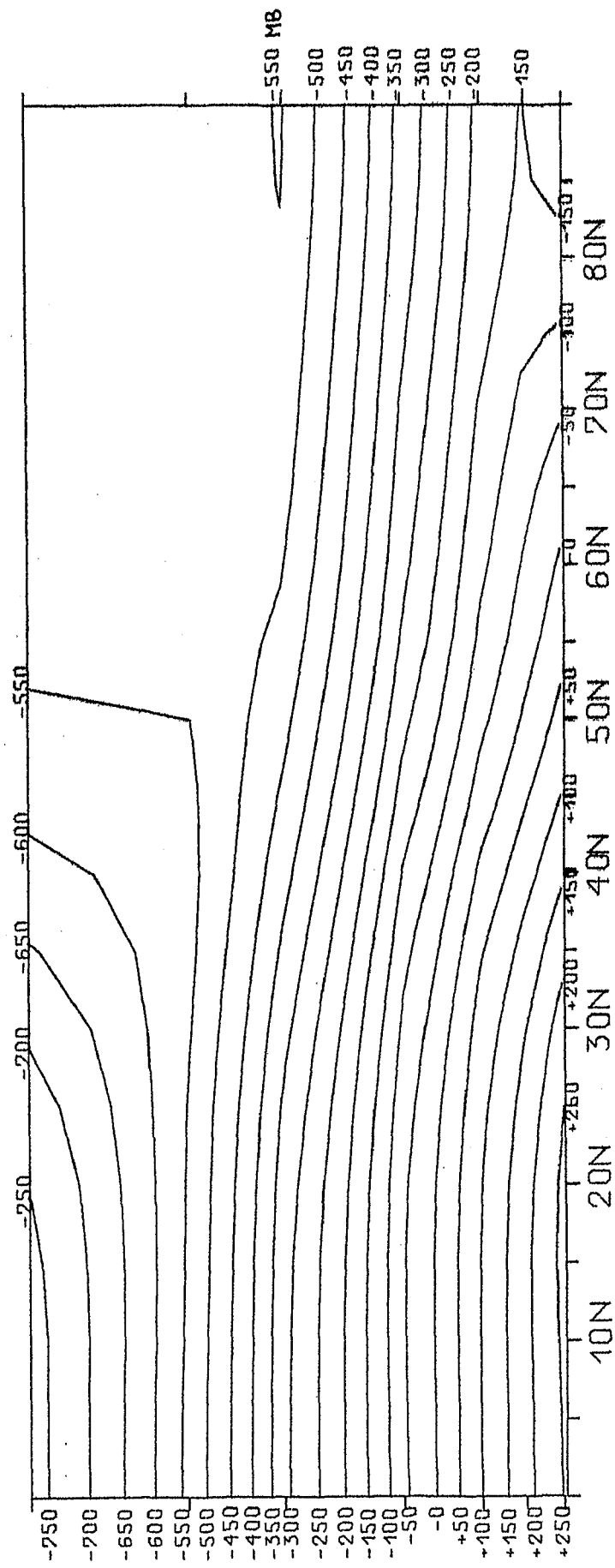
$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT.67

KENNZIFFER: 34106800



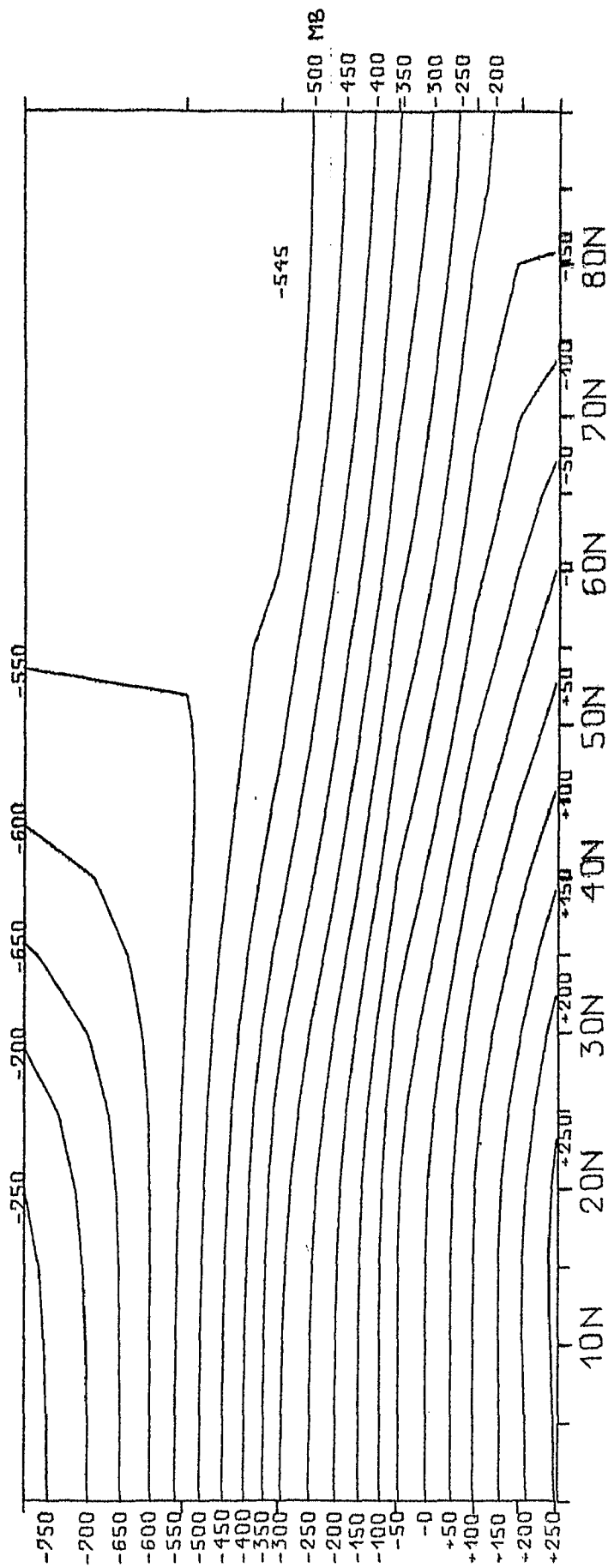
$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 68

KENNZIFFER: 34106900



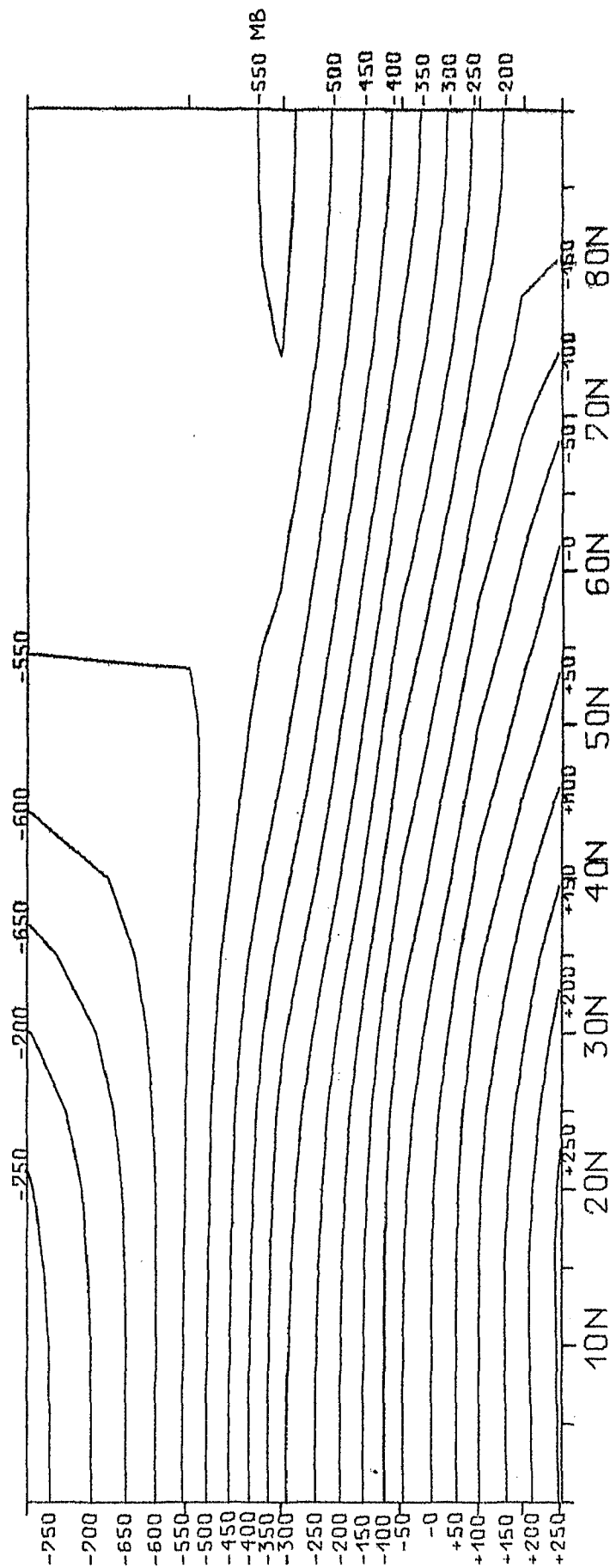
$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 69

KENNZIFFER: 34107000



$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 70

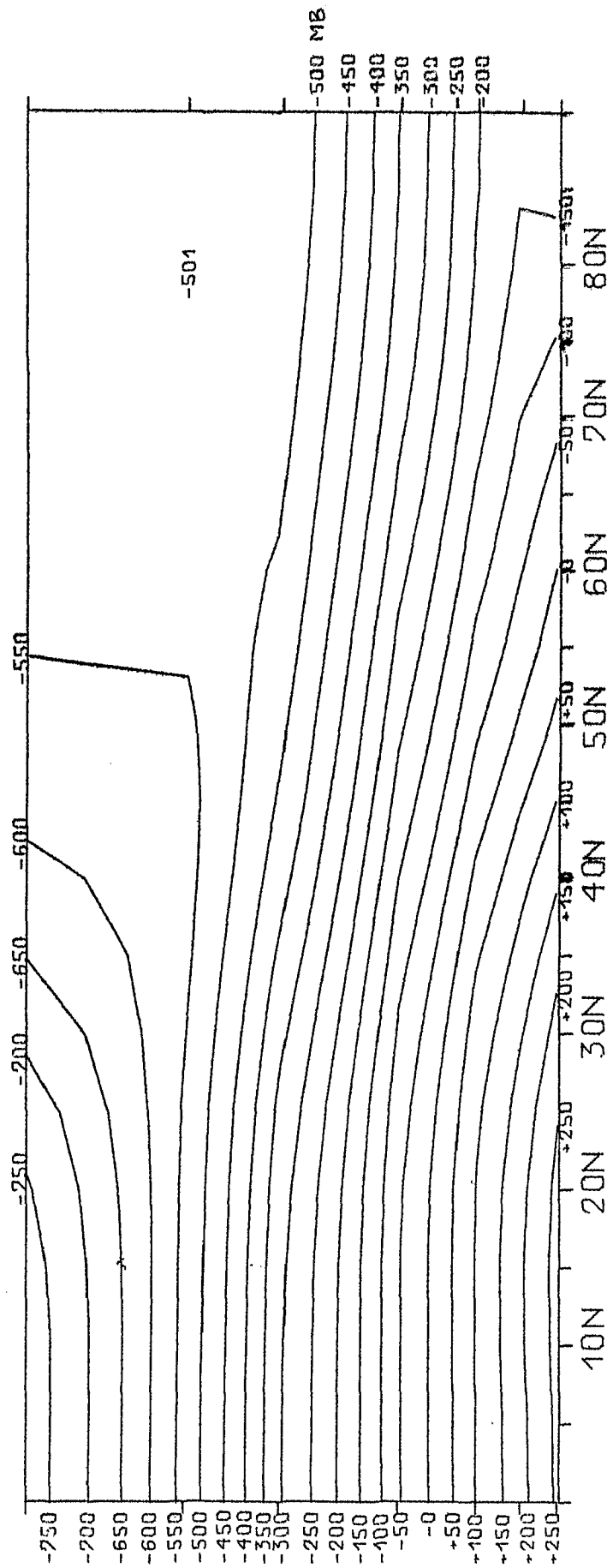
KENNZIFFER: 34107100



$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 71

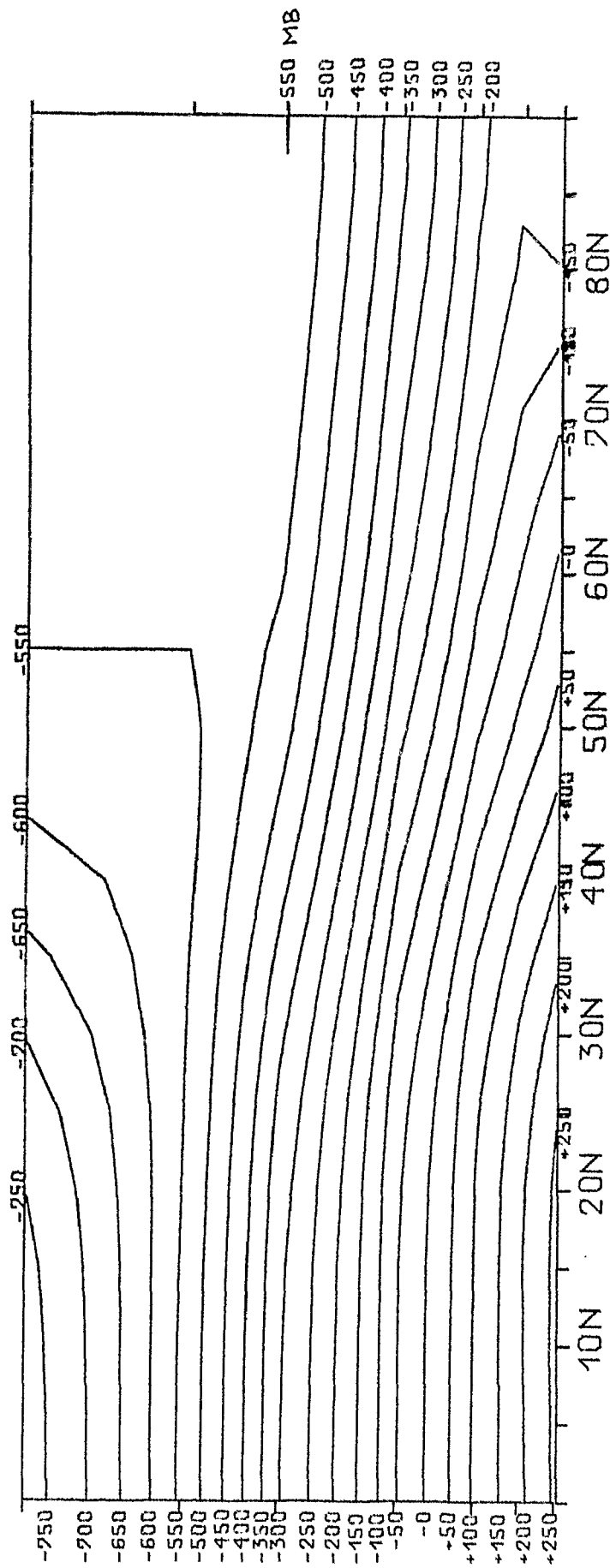


KENNZIFFER: 34107200



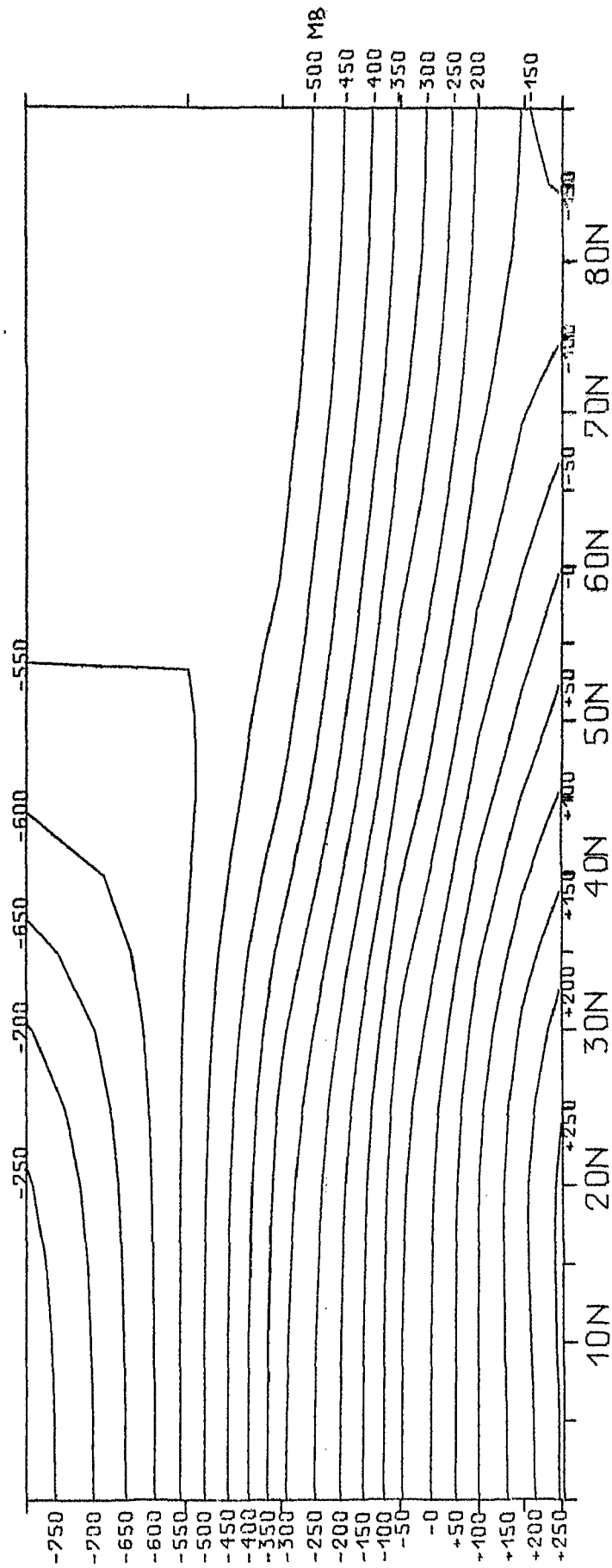
$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 72

KENNZIFFER: 34407300



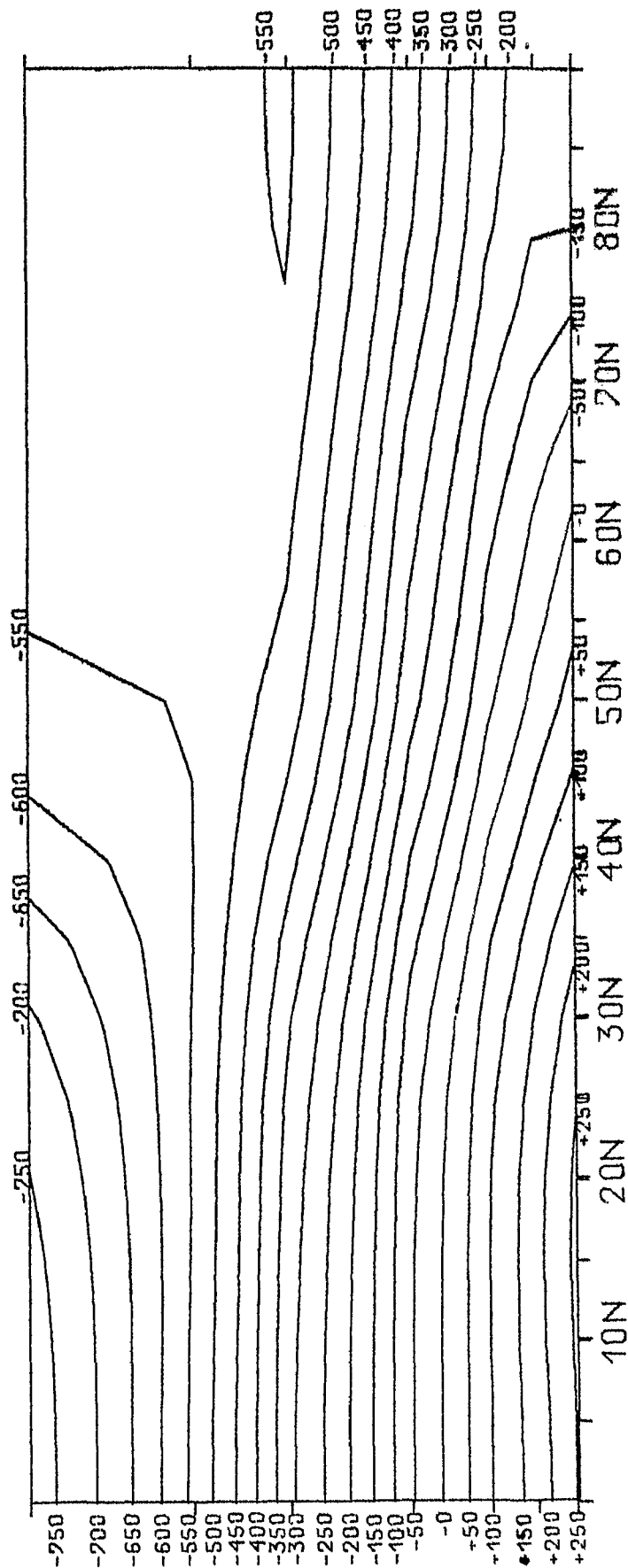
$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 73

KENNZIFFER: 34107400



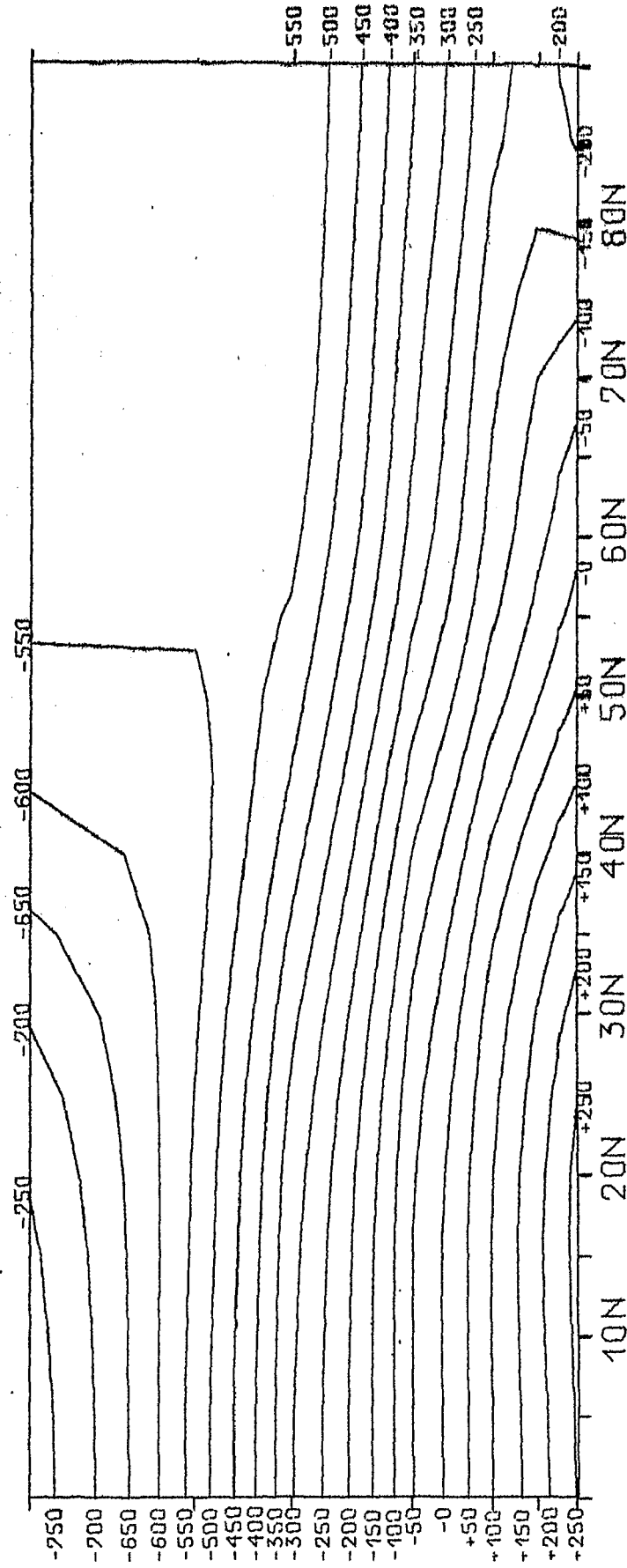
$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT. 74

KENNZIFFER: 34107500



$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT.75

KENNZIFFER: 34407600



$[T]_{(\lambda)}$  IN 1/10 GRAD C OKT.76